THE CONTEMPORARY PROJECT
REFITTING INDUSTRIAL CERDÀ

Reorganising Cerdà Blocks with Can Ricart Precinct

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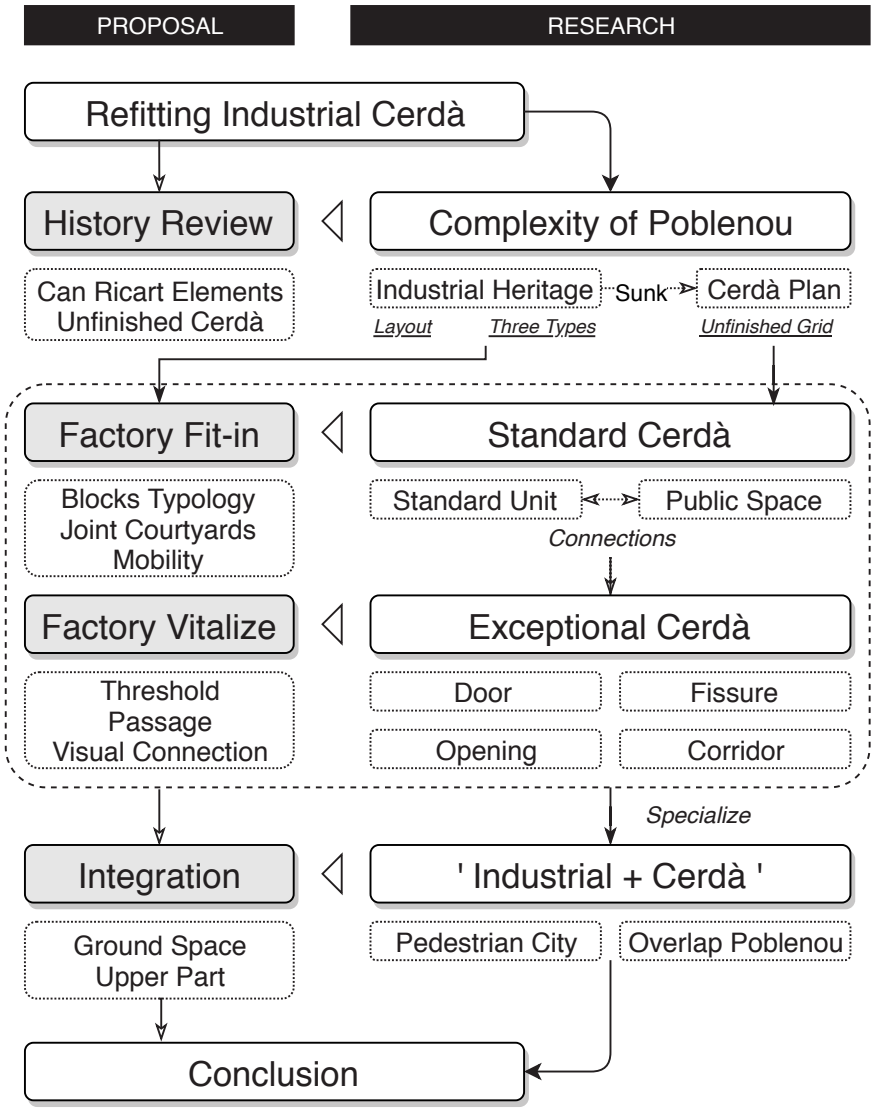
Thesis Map



Keywords Industrial heritage Cerdà Planning Refit Poblenou

Abstract

The layout of Poblenou is complicated, combined with many layers, including the Cerdà Grid and practices following it, different kinds of industrial heritage and its layout, etc. They are different and contradictory, for carried out in different historical periods and from architectural thoughts. As Cerdà grid gradually approaching, many of industrial heritage sunk and scattered into the orthogonal grid. The old layout has been dissolved into new context. However, they brought ´diversity´ to Cerdà grid, which is the crucial value in the evolution of Cerdà in Poblenou. It naturally generates chances for evolution of new Cerdà to accommodate and integrate various and contradictory elements here, and can be identified as ´Industrial Cerdà´.

Thus, ´Industrial Cerdà´ in Poblenou should not be simply described as ´orthogonal grid´, but the carrier of diversity and ´non-Cerdà´ layers in Poblenou as well. Thus, thesis mainly focuses on three basic question: How to insert industrial heritage into Cerdà block? How can industrial heritage refit the form of Cerdà? And how to integrate them together? The thesis will be divided into 3 aspects.

Firstly, standard Cerdà, as well as many orthogonal planning in history, emphasizes the concept of ´unit´ and their solutions of generating public spaces. It shows a critical idea of individual but common cluster for safety and sense of belonging, while assembled for urban spaces. Thus, they are not enclosed, with some connections to context. Among some new Cerdà blocks in Poblenou, courtyards are reorganised as urban space in larger scale.

Secondly, Cerdà plan can never be perfect standard model. Exceptional plots of it create horizontal diversity to various circumstances for Cerdà practices. It emerged from compromises when facing with reality, including function, entrance, landmark, etc. In order to establish positive interactions between courtyard and context with visual, functional and mobility connections in different types in different parts of a standard model.

Thirdly, industrial heritages and its layout are supposed to contribute to reform of Cerdà blocks to improve the quality of pedestrian level spaces of Poblenou, which can be achieved by overlapping. Many architects expressed their ideas of integration different layers of activities and context, which could help to create vertical diversity for Cerdà forms. Meanwhile, heritages can also be well absorbed in pedestrian spaces for city life.

To take Can Ricart as example, this thesis aims to practise formal strategies for industrial heritage to refit in Cerdà block in Poblenou, and also help them to assimilate into new communities there.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Córcega
Roselló
Provença
Pasaje de Centelles
Camino
Calle

Complexity of Poblenou

When Industrial Heritage Meets ´Cerdà´

Cerdà Plan Expansion and Sunk of Factories in Poblenou
Three Types of Industrial Heritage
Can Ricart: Factory, Chimney, Precinct and Unfinished Cerdà

The layout of Poblenou is complicated and special. It was developed by different layers gradually through history. Nowadays, it is mainly defined by two layers of layouts, which is pre-Cerdà and Cerdà Plan expanding from L´Eixample.

Before 1850s´ Cerdà Plan of Barcelona, Poblenou was usually flooded for its close distance to seaside. Thus, it has a long history of agricultural and industrial activities, accompanying many railway lines, roads or canals connecting adjacent districts. As a result, many industrial heritages still remain in this area. They are various in angle and scattering in cluster in Poblenou. Nowadays, there are mainly three types of industrial heritage in Poblenou, including chimney/ water tower, factory and precinct.

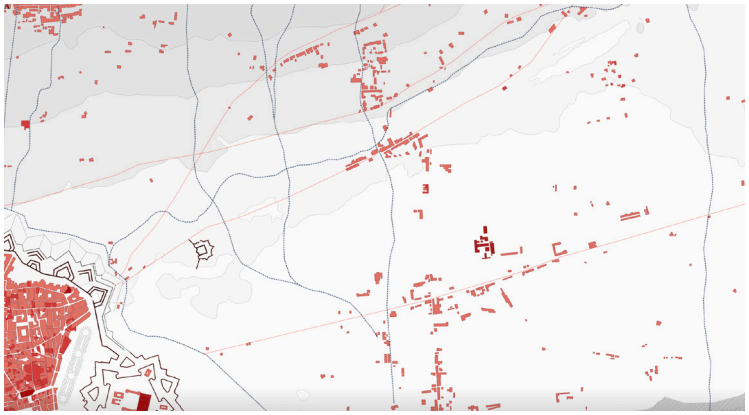
After the arrival of Cerdà plan, the orthogonal urban layout, parallel to the coastine, gradually extended from L´Eixample to Poblenou. It absolutely conflicted with original layout. Industrial buildings were sunk in rational grid of Cerdà. Some original ones were demolished partly to fit in the grid of Cerdà. Others remains as connections in some ´unified´ blocks where Cerdà expansion was suspended to be incomplete. Different types of them were conducted in various situations.

In order to deal with the contradictions between two layers properly, and highlight the industrial heritages, which are DNA of Poblenou, studies on refitting form of Cerdà blocks to accomodate industrial heritage are supposed to be made. At the same time, heritages will also be reorganised to join into Cerdà layouts.

Can Ricart, a industrial heritage precinct marked BCIN-A, awaiting to be converted. It has almost all elements of other heritages here. Meanwhile, contradictions of layout and public spaces are also awaiting to be solved. In this chapter, we will make analysis on different aspects of Can Ricart to make a clear cognition of it.

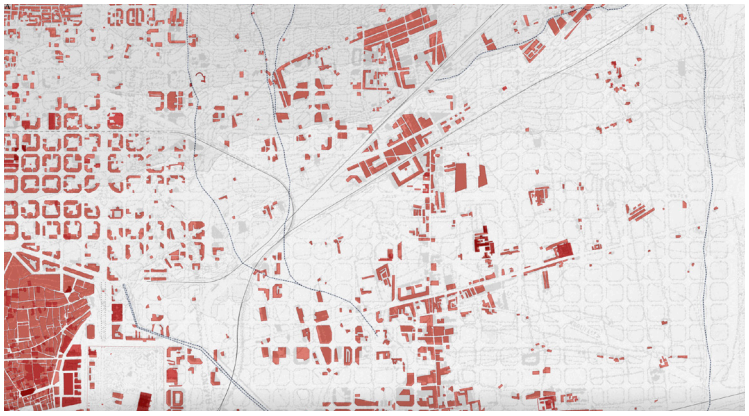
Figure 1.1 A Mixture of Industrial Precinct and newly established Cerdà Grid, 1945

Figure 1.2 Original layout of Industrial Heritages were affected by Cerdà Grid Expansion



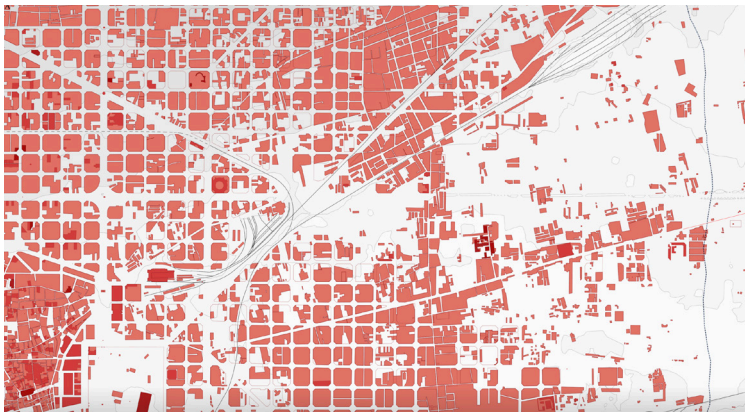
1840

Original layout of Poblenou with pitched and narrow roads and railways, and also canals. Some factories were constructed.



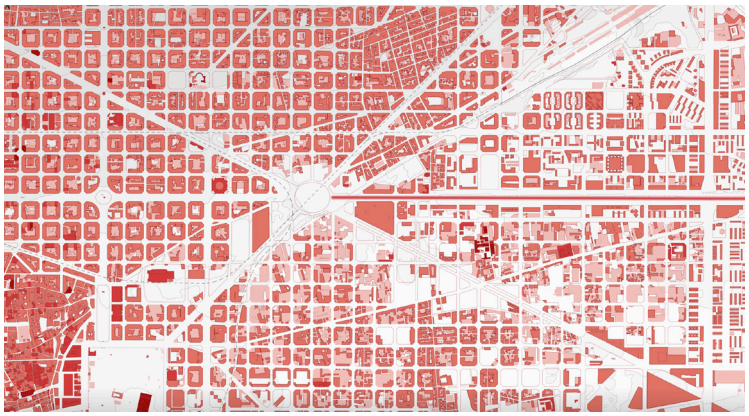
1890

After Cerdà´s Plan, newly built factories or facilities were also restricted to fit in the orthogonal grid and corner chamfer rules.



1950

Urban facilities and blocks finally arrived in Poblenou.



2004

Today, many factories still remain in Poblenou blocks, awating to be converted, converted yet or disused.

Figure 1.3 Process of Cerdà Expansion in Poblenou

Cerdà Plan Expansion and Sunk of Factories

Before the arrival of Cerdà grid, the layout of Sant Martí de Provençals was scattered and diverse. Southern part of Sant Martí was flooded occasionaly due to the close distance to mediterranean coastline. Thus, residential areas appeared very late in history until people learnt to take measures to defend it later. Because of the abundance of water and the low cost of the land, it had become an attractive district for industrial companies to settle in, together with a rise of production in Industrial Revolution in 19 century. Because of flour mills and factories for different sectors, including food, chemicals, metallurgy, it attracted, it had a nickname called ´Catalan Manchester´.

Early clusters were mostly concentrated in Icaria district, C. Pere IV and waterfront, following the directions and alignment of essential facilities here, like roads, railways or canals for water supply. The layout was quite different to what we can see nowadays. Pitched alignements and irregular shapes of cluster provide chances of diversity for latter revolution of Cerdà block here.

Cerdà plan was firstly carried out by Ildefonso Cerdà in 1860. A decades later, due to the demolishment of walls, the disappearance of the Ciutadella military fortress, the land of Sant Martí was gradually occupied by Cerdà grid from downtown area of L´Eixample district step by step. Several decades later when Cerdà grid layout was relatively developed in downtown of L´Eixample, fragements of Cerdà grid appeared in Poblenou as well. During the end of 19 century and the beginning of 20 century, a mixture of layouts was forming with old layout and some newly built factories the peripheral rules of Cerdà planning, especially in the southern part of Poblenou. There are still some factories which have built additional parts without obeying Cerdà rules in the northern part of Poblenou, Provençals del Poblenou. From 1950 to the beginning of 21century, other parts of Poblenou were gradually constructed in the rule of Cerdà planning. (Joan Busquets, 2005)

If we put old orthophoto of Poblenou, we can not only find out irregular passage remaining in old layout, but also find out some factories had been demolished partly or totally vanished nowadays due to grid spreading. However, although a lot of changes occured to industrial heritage in Poblenou. Many of them still remained independent to resist against Cerdà planning. Industrial heritages which have absolutely different layout seem to be isolated islands in Cerdà blocks and also surrounded or enclosed by them.

During the spreading process of Cerdà grid from the end of 19 century, industrial facilities were affected to fit in the new layout or demolished completely. However, there are still some traces of old layout, such as completely preserved ones from Icaria, Carrer Pere IV and factories attached to it, and also some fragments of those scattering in other places, which have been preserved well in various situations in contemporary Poblenou. Some of them are still preserved to be the original

Two Types of Contradictions - Cerdà blocks compromise to super heritage

Figure 1.4 Cerdà Blocks Joint by Industrial Heritage in Poblenou

Figure 1.5 Recent Hispano Olivetti was transformed as shopping mall

Figure 1.6 Hispano Olivetti (1979)

Two Types of Contradictions - Super heritage compromise to Cerdà blocks

Figure 1.7 Passages & Roads from Old Layout

Figure 1.8 Old layout connects blocks and generates diverse public spaces

usage for mobility, but owing to different scales of them, some like Carrer Pere IV is still used by vehicles, while others like Carrer Marià Aguiló can only be taken as pedestrian lanes for connection.

There are some exceptional pieces of them, too. Some passages from old industrial layout have been emphasized by reshapping public spaces to attach to old passage or alignment. Going through several Cerdà blocks in contrdiction, these passages can open the courtyards of blocks to interconnect several blocks with dynamic interfaces and scales, presenting chances or unique points of Cerdà block transformation in Poblenou´s historical layout. Meanwhile, industrial heritages and public spaces nearby appear to be the center of activity in such united blocks, which are crucial for collective memories, service or tourism.

Palo Alto, an industrial heritage precinct formerly used for wool spinning, stack and sugar producing, together with Jardins de Remediós Varó and Carrer dels Pellarires, interrupts Carrer Fluvià to seafront area.

As for precinct itself, nowadays, the precinct is occupied by 31 companies, providing nearly 400 career positions for Barcelona. Most of them major in design and exhibition. The old heritage shows its vitality in productive activities for development. On the other hand, the courtyard of Palo Alto is intended to open to public, integrated with Jardins de Remediós Varó together. Meanwhile, instead of hesitation of the contradiction between Carrer Fluvià and heritage preservation, it can contribute to shared public spaces and combine two adjacent courtyards of Cerdà block to be a bigger one, increasing the diversity in scales of blocks but remaining the basic shape of Cerdà to be unchanged.

Besides, some Cerdà blocks are combined by industrial heirtage to preserving heritages and old layout of per-Cerdà period. This kind of industrial heritages are usually located at the boundaries between several adjacent blocks, such as Can Ricart and la Escocesa, or as are large or long enough to occupied several blocks by themselves, such as Palo Alto, Hispano Olivetti, Sala Beckett and Can Saladrigas.

Among these ´super heritage block´, Hispano Olivetti is a unique project. It was originally a typewriter factory in the past, but now a cluster of office buildings and shopping center, shows resistence and compromises to the Cerdà grid spreading.

But the precinct of Hispano Olivetti was not built altogether. At first, it only occupied two blocks in the north and had been completing the peripherals for a long period. Besides, even though it was used to be a typewriter factory, it provides many facilities for leisure activities, such as water pool, restaurant and sports ground. Summer camps were even held by company for kid to spend their 15 days here. So at first, it was never a mono-function industrial precinct here.

Good times doesn´t last for long. Due to the invention of personal computer, business

Figure 1.9 Protection Level of Industrial Heritage

Figure 1.10 Types of Industrial Heritage

Figure 1.11 Water Tower / Chimney - Single Factory - Factory Precinct

of typewriter became tough and hopeless. The company broke down suddenly in 1987. Regarding wonderful location of precinct towards Plaça Glòries, precinct was most of factories demolished except for the oldest structure and rebuilt to be a cluster of shopping mall. It also received many criticism.

After renovation, two parts of precinct finally came to be integration by transforming the original passage for vehicles tobe pedestrian lanes, which shows new identity of streets in Cerdà grid.

Three Types of Industrial Heritage in Poblenou

Poblenou is full of different kinds of industrial heritage representing a great time span of history in development of industry. Some of them still remaining today has been ranked into levels of preservation from BCIN-A to BCIN-D, refering to the value of historical value and current conservation situations. Majority of them are listed as BCIN-C or BCIN-D, which can be recognised by city hall or partly transformed. They have something of historical interests to be continued. And as a matter of fact, most of them have been renovated or transformed into other usages, like civic center, office headquarter, hotel, etc.

There are also some industrial heritages which have relatively higher value comparing to other industrial buildings in Barcelona or Catalunya, such as Can RIcart, Ca L´Illa, la Escocesa, Industrias Waldes, Can Gili Nou, etc. Due to better preservation situations today, many of them still remain the original precincts or details of buildings like façade. There is only one industrial heritage interest, which is the only one ranking BCIN-A in Poblenou, called Can Ricart. We can hardly do any changes to its factories without permission of Catalan Government.

Nowadays, there are generally three kinds of industrial heritage in Poblenou: Chimney / Watertower, Factory, Factory Precinct.

UNFINISHED CERDÀ

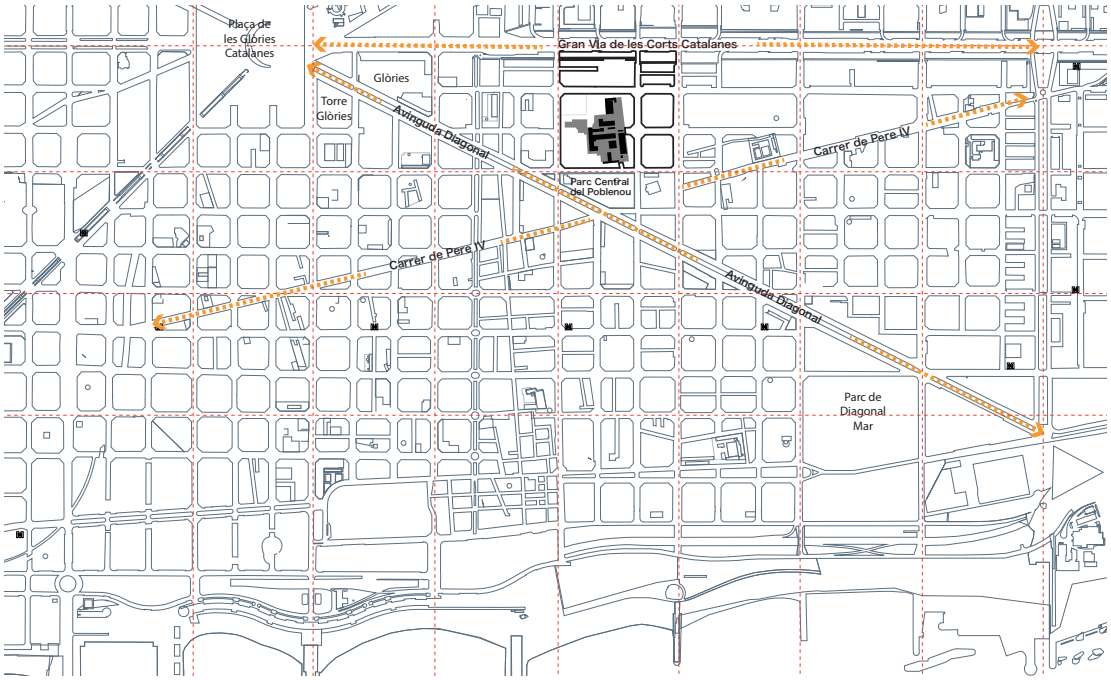


Figure 1.12 Location of Can Ricart

Figure 1.13 Cerdà Layout of Can Ricart Surrounding Can Ricart

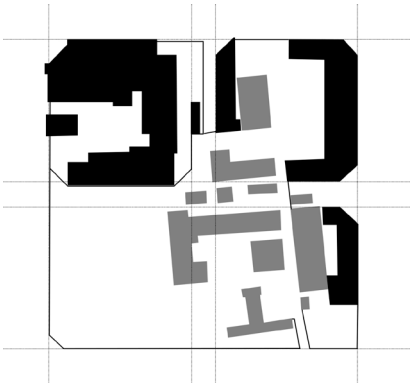


Figure 1.14 Unfinished Cerdà Layout of Can Ricart

Current usage situations of towers in Poblenou can be negative for it is hard to find new functions for them. Some of them are reused for tourism. For example, Besòs Water Tower was used to supply water to residents. But due to the salt it contains, after changed to supply water to refrigeration systems, it is now the headquarter of Poblenou Historical Archive and is open to the public, together with adjacent valve house. Towers can also be reused by transforming to deliever information for context, such as ´Urban Thermometer´ in PSA , Shanghai.

As for single factory, some of them were from original industrial precinct, which were forced to separate under the economic downturn during the Franco regime period. Thay were subdivided into different part and were rent individually. Thus, only a few of them remain today. Some other single factories are nothing like a factory, but like additional buildings serving factories, such as worker´s cooperations or associations. They have more advantages in interior space to transformed into new functions today, such as Sala Beckett. Besides, single factories built in different historical period has various formal relations to Cerdà block. Most of them appear to be part of Cerdà because they were built under Cerdà grid, while others still remain contradictory to Cerdà grid, as isolated fragments in courtyard.

As is introduced in last section, precincts are well preserved industrial heritage. It contains other kinds of industrial heritages, but also precious information and traces of original layout, which other types of heritages excluded. Besides, except for Ca L´Illa, most of them have strong contradictions with Cerdà grid, which have been discussed in last section. (El Globus Vermell, 2019)

Can Ricart: Factory, Chimney, Precinct and Unfinished Cerdà

Precinct

- Precinct Before Cerdà Grid

Can Ricart was one of three earliest factory precinct in Barcelona, among Can Batlló in Carrer Urgell and la Bordeta. It is formerlly used as cotton print factory in the mid 19 century. It is recognised as the earlist mechanical factory precinct in Barcelona, which miantain details of old industrial period in Barcelona, when Poblenou was called ´Catalan Manchester´. It remains the neo-classical facade from 18 century, but with metal framework, pavements, handle, etc, as well. It contains a full record of early industry in Barcelona and Catalunya. Thus, it is of highest historical value in Catalonia, ranking BCIN Level A Protection.

Alongside the axis of Carrer Pere IV, which was also the main mobility in pre-Cerdà layout. Nowadays we can still find there are many industrial heritages following the street, such as Can Ricart, Oliva Artés Workshops, Ca L´Alier, La Escocesa, etc. Parallel to Carrer Pere IV, there is also a fragmental urban axis which used to be a street as well (Page 16). However, it is now hidden

PRE-CERDÀ LAYOUT

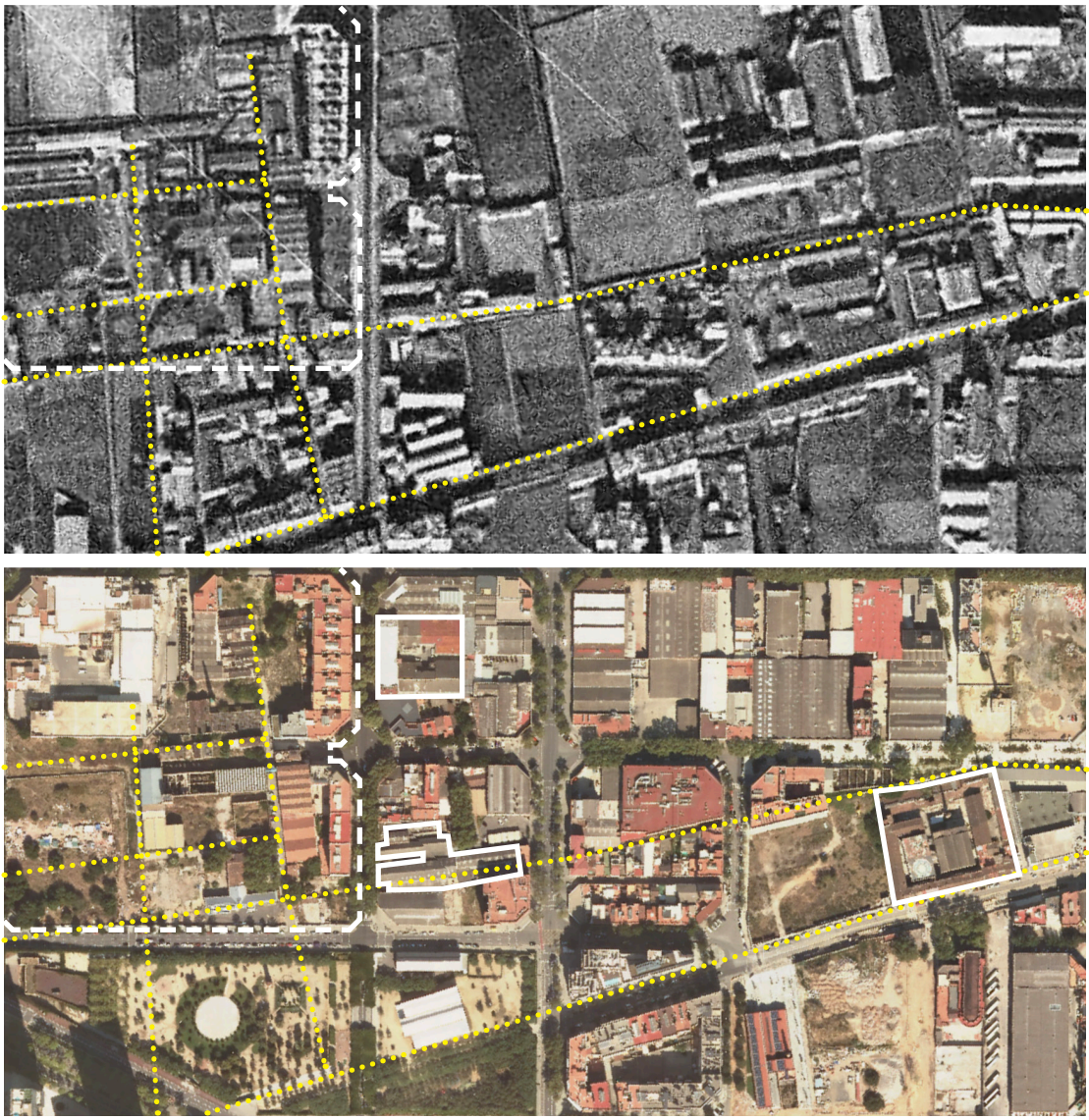


Figure 1.15 Adjacent Urban Layout in 1945 and 2016

in several Cerdà blocks. We can also find more urban axis in smaller scale in current layout, which are closely related to the developing process of Can Ricart.

The plan factory precinct was originally designed by famous Catalan Architect, Josep Oriol Bernadet from 1852 in the first stage of project. He was an architect and scientist. He designed a assembly line of cotton printing from texture design, dye processing, fabric processing and printing. Meanwhile, neo-classical style was applied to the facade of Can Ricart. Although he didn´t finish all the project in Can Ricart, but the general plan of it had been continuing for a long time until the end of 19 century.

From 1865 to 1888, the precinct project was continued by Josep Fontserèi Mestres. He finished mostly the design and construction process of Can Ricart. His contributions were mainly about the eastern passage and factories standing by. Also, he extended precinct to the north part of current precinct. Basically, it became the most valuable factory precinct in Sant Martí from 19 century to the beginning of 20 century.

- Unfinished Cerdà Grid

Cerdà grid firstly appeared to Can Ricart in the first half of 20 century, establishing a standard block and some fragments of it. Nowadays, Can Ricart is planned to be part of superblock, together with other 4 blocks (equal to 5 Cerdà blocks. The streets on north and east side are intended to be turned to pedestrian-friendly. However, Carrer Bolívia is currently interrupted by Can Ricart for its four small factory remains there. Besides, hte precinct doesn´t seem to be well interact with current Cerdà peripherals (three isolated buildings, two dwellings, one garage). Due to the demolishment of western part of precinct, the wasteland needs to be complete, how to establish a set of new Cerdà peripherals while having good interactions with old remians also worth discussing.(Can Ricart Estudi Patriminial, 2020)

Can Ricart is located between three important urban axis of Barcelona, Gran Via de les Corts Catalanes, Avinguda Diagonal and Carrer Pere IV, which was the main axis of a series factories, such as Oliva Artés, Ca l´Alier, la Escoceca and Ca l´Illa in Poblenou and Sant Martí. The Central Park of Poblenou is located nearby. Thus, Can Ricart is supposed to contributes to urban activities, instead of just serving adjacent communities. However, because of the privacy requirement of residents in Can Ricart blocks, the precinct is also supposed to benefit community activities. As a result, it would be better if Can Ricart was transformed into different levels of public spaces intensively with different ways for renovation.

The Cerdà grid had never totally appeared in Can Ricart precinct at least before the mid of 21 century. The factory precinct was originally irregular in shape because of land division or canals. As the street network spreading, some factories in southern and western part of precinct, which was constructed after 1888, were demolished to establish the limits of new urban

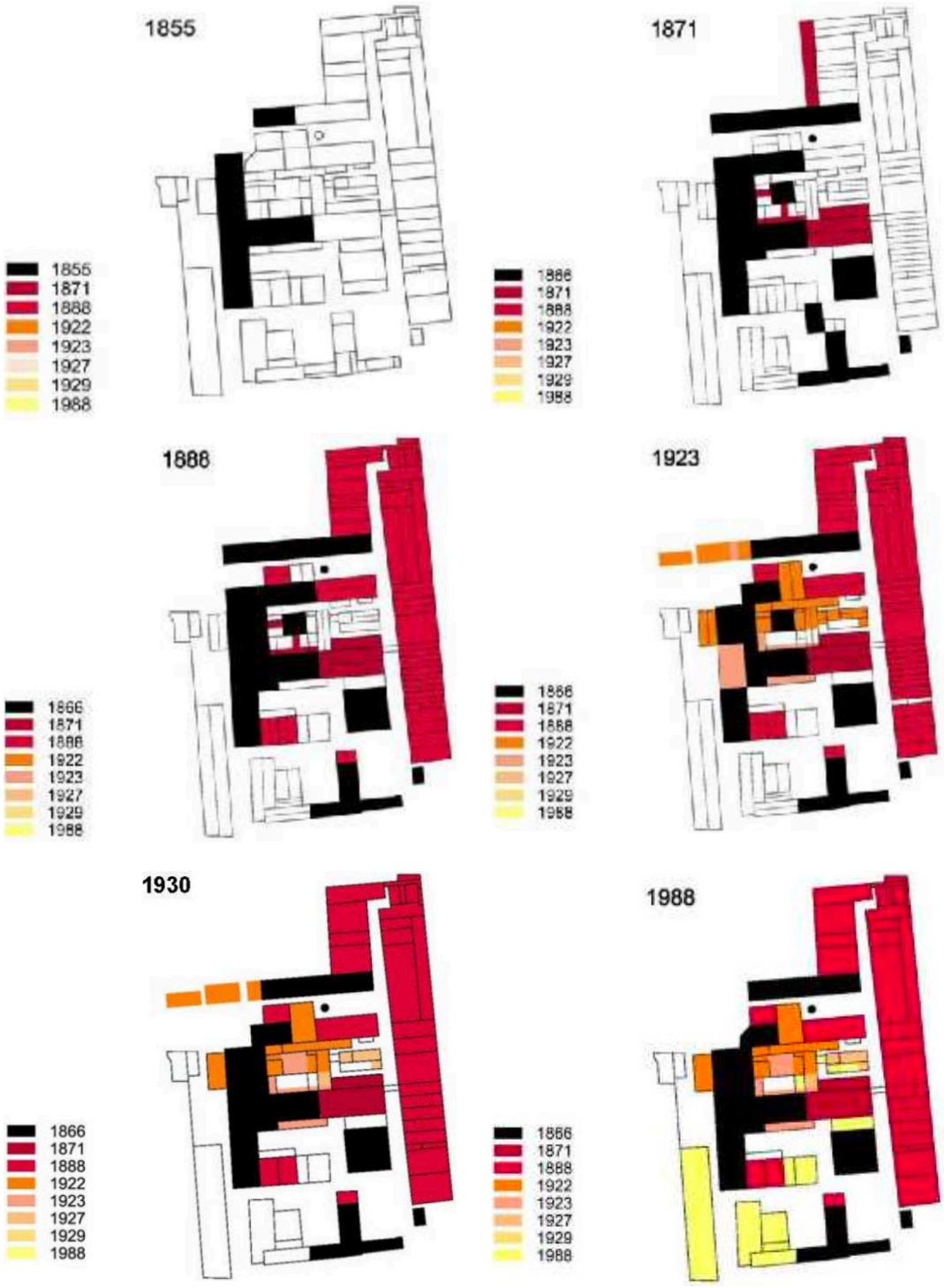


Figure 1.16 EVOLUTION OF PRECINCT

1945

The precinct original. Some corners began to transform into Cerdà Block.

1986-2004

New peripheral was under construction, while some factories had been demolished.

2012

Some rooves of factories has been demolished or changed till now.

Figure 1.17 Formation of Cerdà Grid around Can Ricart

layout.

At the same time, some new factories, following the grid of Cerdà, were rebuilt in this precinct for other usage such as rent, soap production, cold drinking or education, especially in 1980s. But they were of less value, comparing to the factories built before. The original spatial structure appeared to be clear: A main passage connecting north and south, with factories built in different period on both side, but in different directions on the right and left. Three courtyard in the north, mid and south entrance were set between the intervals of factories, which have different functions regarding their locations and factories nearby. Besides, some factories were broken by nature in recent years, such as the roof of main factory and garage.

Thus, from 2004 to 2012, many demolishments and refurishment happened partly in the precinct of Can Ricart for reduction of original design of Josep Oriol Bernadet, under the process of urban expansion. One of factory in the northern part from bernadet was also destroyed by historic reasons. And as a matter of fact, there are only four parts of precinct were listed in preservation plan made by municipality, which are the factory by Bernadet, the central factory and its bell tower, chimney and storage building. Besides, Can Ricart is also taken advantage by many companies and associations.

Can Ricart remains the original pitched axis of argiculture and industrial revolution period in Poblenou, which seems to be contadictory to Cerdà´s Layout since 1850s. Nowadays, it occupies four standard Cerdà block and prevents Carrer Bolívia going through itself. On the other hand, old layout of Can Ricart, such as passage in the eastern part, the entrance square, the T shape main factory,etc., still remains unchanged. They look like ´capillaries´ in the body of the district between Carrer Pere IV and Poblenou Central Park designed by Jean Nouvel, which are positive to future Can Ricart Renovation.

Some competitions and workshops have been hold for renovation, which attracted many famous

FACTORY / BELL TOWER / CHIMNEY

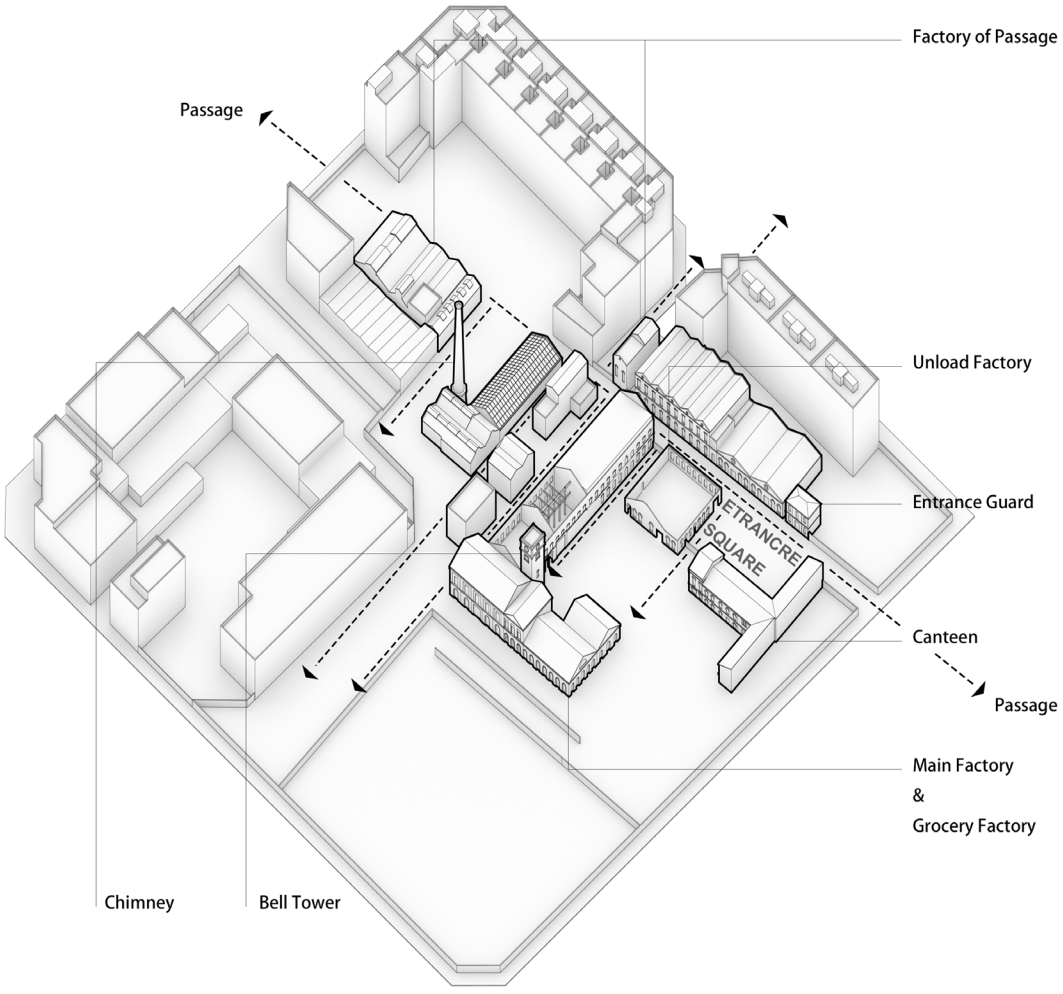


Figure 1.18 General Structure of Can Ricart Precinct

architects office, such as ABAA, EMBT. But it lost the original scale and various public levels of activities. EMBT was trying to transform the southern part of precinct as a language school, and made some renovations on facade and circulation of original building.

However, the proposals doesn´t show any idea of how can this industrial heritage precinct get involved formally into Cerda grid in harmony. The contradictions between two layouts should interact positively. So it remains to be study that how can two kinds of layout effect each other when integrating them into a new Cerdà form.

Factory

Unlike other industrial heritages in Poblenou, factories in Can Ricart were designed in Neo-classical style from Josep Bernadet's idea. Fortunately, his successor, Fontserèi, continued its work under Bernadet´s proposal and practice. So after several times of constructions and demolishments, factories of Can Ricart still remains original form generally.

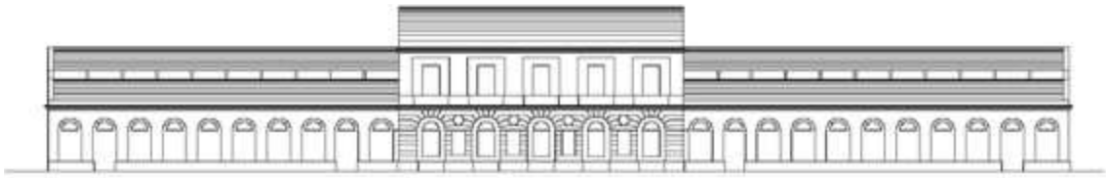
- Main Factory & Grocery Factory

Main factory is the oldest and most valueable factory of Can Ricart. It was firstly designed in 1853 by Josep Oriol Bernadet. Although it looks quite different when comparing the original design and current situation, most of elements were preserved, like arches of windows, line feet, etc.

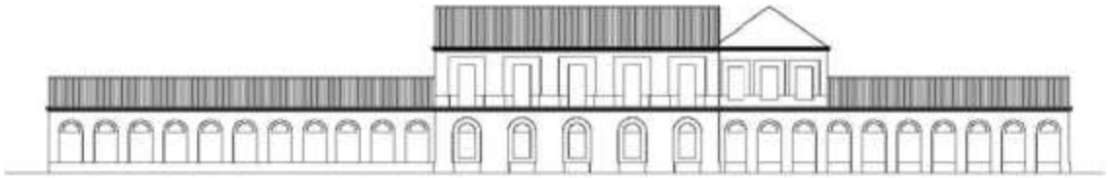
As is shown in the original design from Josep Oriol Bernadet, the main factory was a T-shape factory, with main façade facing west. It was symmetric, neo-classical, three-stage factory in the beginning. However, in 1888, the engraving drawing from Castelucho showed that an excerpt of volume was changed to vertical direction, leaving the gable façade facing west. The original integrated factory had been separated into three connected parts. The shape didn't change a lot in the past century. Also, the left wing of factory didn't exsist nowadays, for some demolishement occured in last century.

Meanwhile, an additional part was built several years later (1871), for new extension functions of main factory, like groceries. The new part respect nearly all the style and details of the old part. And they were assembled as a larger T-shape factory. The construction of other additional extensions on two wings were continuously going on from 1880s to 1920s. These additional factories had less value to preserve, thus most of northern part, together with north wing, have been demolished after 2004, in order to fully reduct the original layout structure of heritage precinct. Nowadays, we can still find some fragment from the north wing.

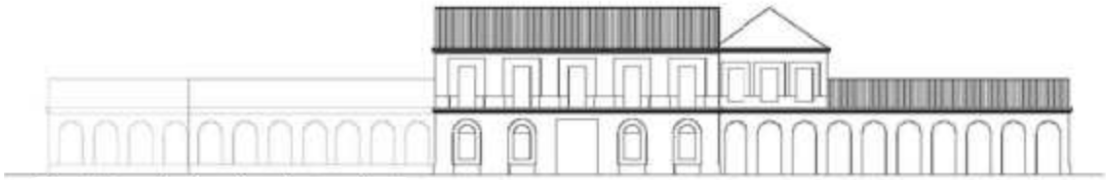
Inner structures were also special and valueable enough to preserve. The main factory can be one of the earliest factories of industrial revolution in Catalunya using iron trusses and columns for structures.



The Original Main Façade Proposal of Main Factory by Josep Oriol Bernadet, 1853



The Main Façade of Main Factory from Castelucho´s Engraving, 1888



The Current Façade of Main Factory (part of it doesn´t exist today)

Figure 1.19 Main Façade of Main Factory

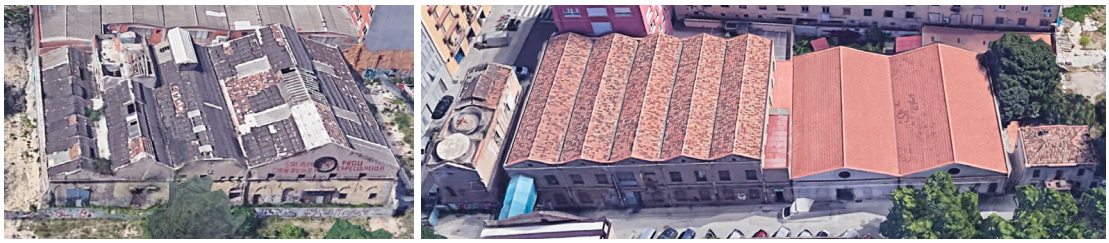


Figure 1.20 Factories of Passage

Figure 1.21 Bell Tower and Chimney of Can Ricart

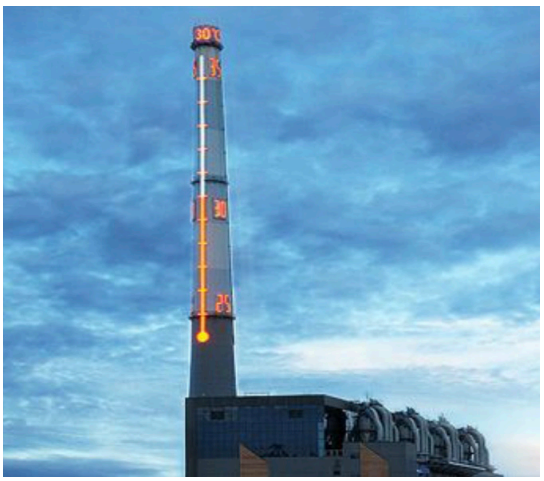


Figure 1.22 Thermometer transformed from Chimney of PSA, Shanghai

- Factory of Passage

Passage was constructed during 1880s. The factory of passage consists a series of buildings in different scales, façades, materials and storeies. In 1931, these factories were taken over by Productos Químicos, while other factories of Can Ricart still belonged to a textile printing company. Besides, a timber covered bridge connects the grocery factory and part of passage factories, which still remains to be unchanged.

However, part of it were demolished due to value judgement by mistake, it also received a lot of criticism. The demolished part of factory is mainly in the north. Newly built dwelling peripherals interrupt the original passage factories on the east side of passage. The end of passage is now open to Carrer Perú.

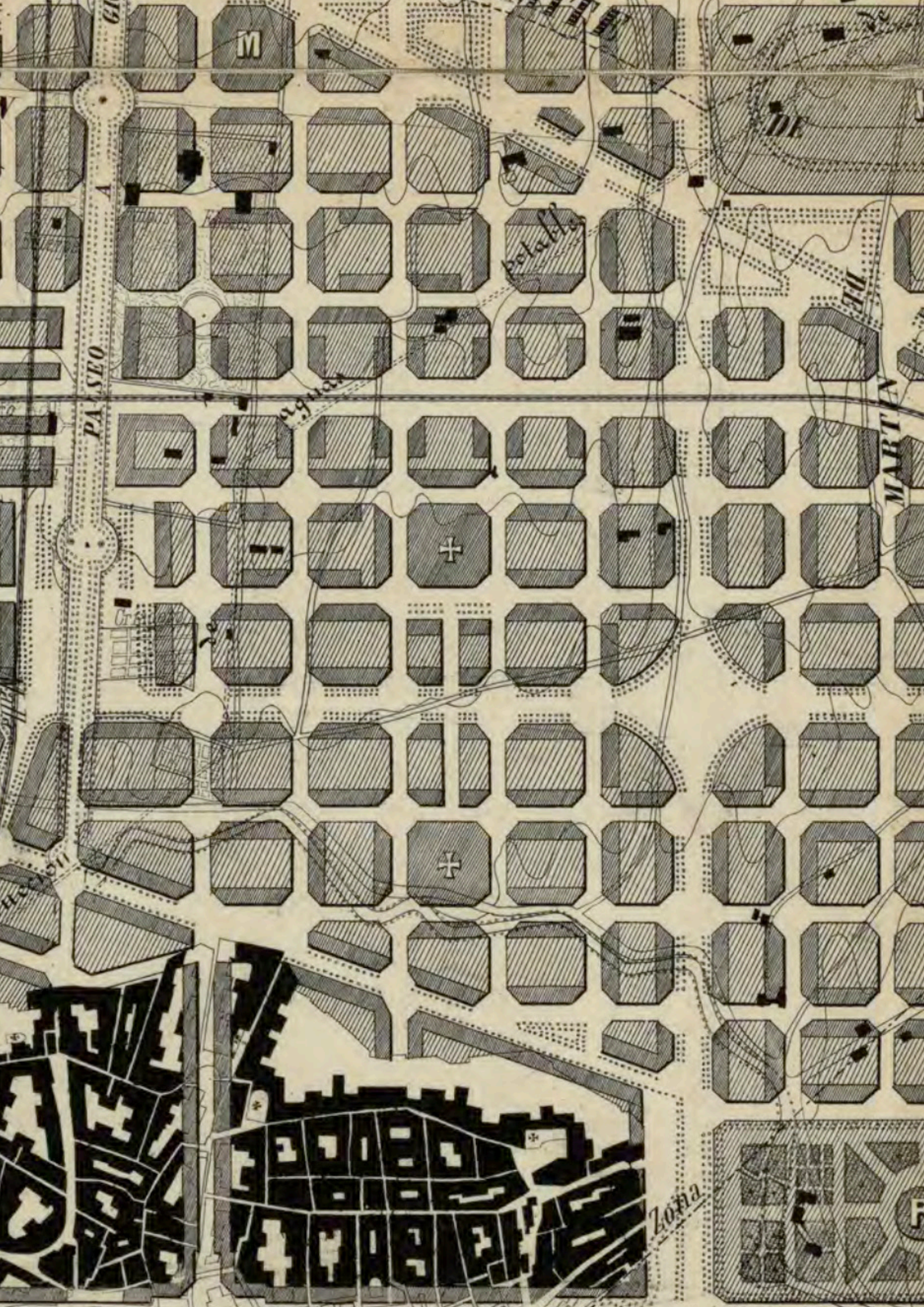
This passage is main mobility of Can Ricart Precinct since the end of 19 century. It has extended to Carrer Pere IV before the mid of last century, connecting the main avenue of city. Following this, other factories built on the south of Can RIcart also existed for a certain period. But as Cerdà grid spreading, especially after constructing the Central Park of Poblenou, they disappeared completely. As a result, the main passage became private again.

- Factories around Entrance Square

The entrance square are enclosed by three buildings of Can Ricart. They were originally used for aceessibility. Goods and raw materials were uploaded and unloaded here in a square shaped storage building near the grocery factory. Then, they would be distributed via other passages to different factories. A T-shape building was canteen for workers. Two T-shape buildings in Can Ricart generates many courtyards of precinct. We can also find a small two storeys building stands near the gate of precinct. It was mainly used for entrance guard.

- Bell Tower & Chimney

Bell tower stands in the crossing part of T-shape main factory. It has neo classical ornament on the top, with is same to main factory in shape. Chimney stands on the northern part. It is so high that can been recognised from very far away places outside og precinct. These tall but unique elements can be reused for urban functions, like thermometer of PSA in Shanghai. It is also a special exhibition hall belonging to PSA. As for the bell tower and chimney in Can Ricart, they are symbolic objects of the precinct, which can be seen from further places. So it would be better if these tall elements can be seen without occulusion in the future. Meanwhile, chimney can be also used as urban thermometer or urban installation art.


PASEO
MARTIN
Zona

Standard Cerdà

Ideal Blocks and Joints ´Urban Units´ for Public Space

Orthogonal Planning: Standard Urban Units and Diversity of Combination
Cerdà Manzana: Degeneration of Courtyard and Evolution of Peripheral
New Cerdà in Poblenou: Courtyards Reorganised as Public Space
Can Ricart: Inserting Industrial Precinct into Cerdà Manzana

As industrial revolution developing, the population of Barcelona was dramatically growing up to 200, 000 in Ciudad Vella. Every hectare was occupied by 859 citizens in average. Besides, pollution, traffic jam, crime, disease...plenty of problems was awaiting to be solved. In 1859, Ildefons Cerdà practiced his theory in exterior district of Ciudad Vella, respecting ideas of equality, diversity, public and low density. He divided L'Eixample with 113m*113m orthogonal grid, with housing placed on two sides of each cell. Public spaces were originally scattering in these blocks. But later then a formal evolution occured. They were enclosed by other two sides of housing. Finally, L' Eixample became homogeneous with similar blocks but seldom urban spaces in courtyards. They became limited public spaces.

The ideal theory of Cerdà, together with compromise of rules later, still shows a clear system of urban spaces, from urban to community. It emphasize concept of minimum ´unit´ in urban context, which is same to some orthogonal grid in history, such as Miletus, ancient Chang´an and Savannah. This kind of standard units provide equal individual living space, but sharing courtyards with others for integration and diversity.

In Poblenou, some architects´ practices show the idea of returning courtyard to public again and organised them in larger scale, just remaining orthogonal peripheral of Cerdà unchanged. Connections between adjacent Cerdà blocks are strengthen to provide public space and proper scale for activities, taking the advantage of courtyards.

In this chapter, Can Ricart will be refit into adjacent Cerdà courtyards. Meanwhile, the old heritage precinct can also be the coherence between blocks. Thus, the space of Can Ricart will be reorganised to join in each block and complete the unfinished Cerdà layout here.

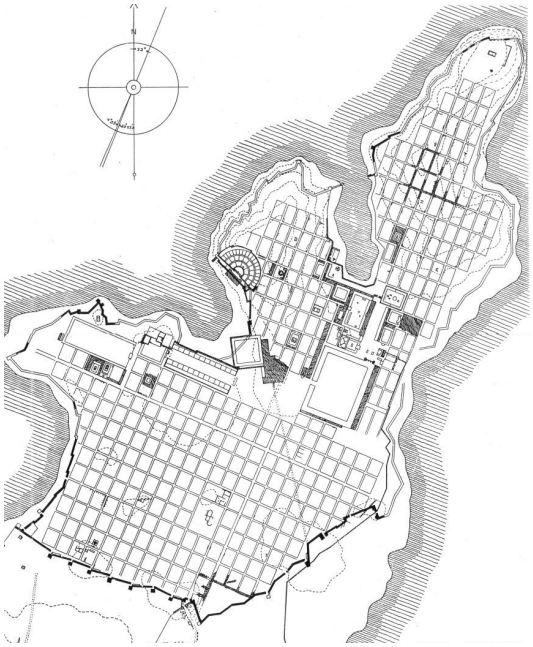


Figure 2.1 Miletus, Greece, Hippodamus, 498-408 BC.

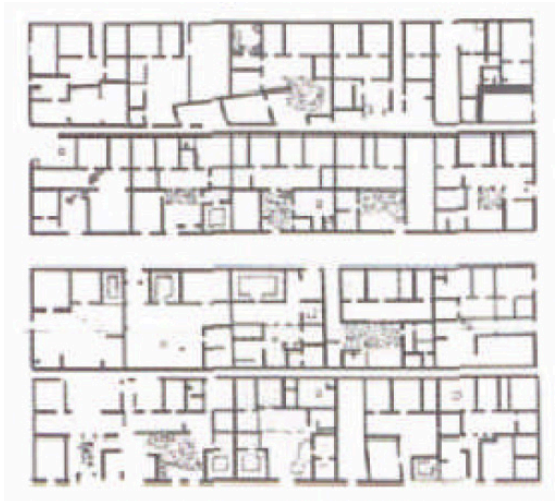


Figure 2.2 Block of Olynth City, Hippodamus

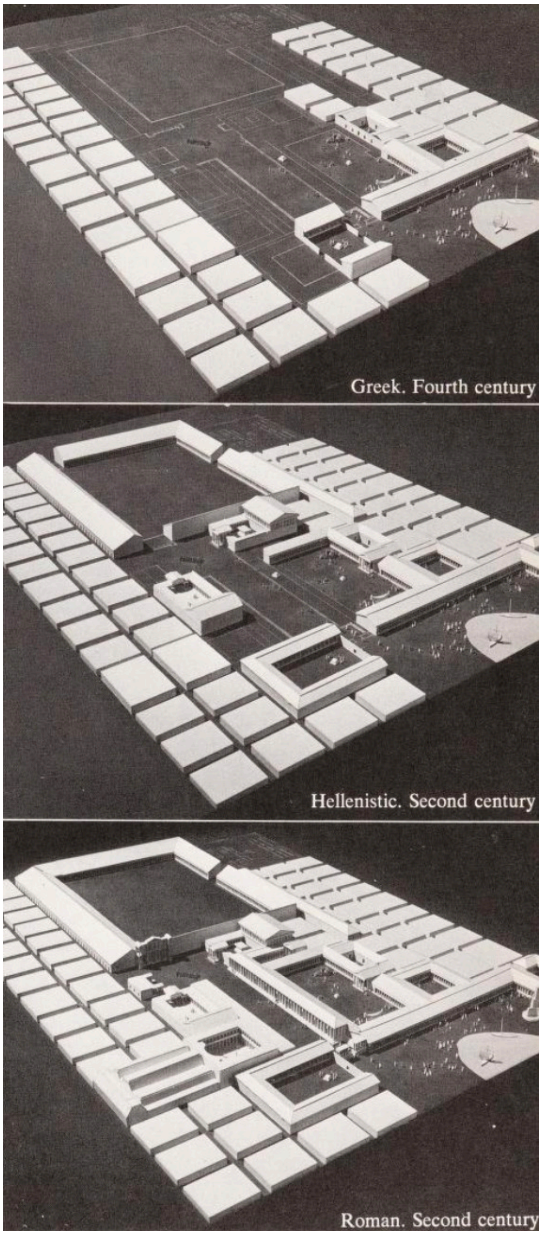


Figure 2.3 Public Parts of Miletus under Regime of Greece, Hellenistic and Roman

Orthogonal Planning: Urban Units with Basic Rules and Diversity

The orthogonal grid iron is ideal urban layout organised by obvious artificial operations and geometric elements. Actually, ‘geometria’ in Greek means ‘land measuring’. The basic work is to divde an indifferent land into average geometric plots. It has generated so many theories and ideas in urban planning history, whether in the ancient eastern or western countries or civilizations. Rectangle can be the puriest geometric shape that human beings can conduct easily. It obesses a sense of simplity, rythm, order and efficiency, but equality as well, which has more meaning in politics and society. It has been practiced in many ancient Greek cities for it looks neat and easy to manage. Thus, it’s so charming that from 4 century B.C. in Greece, to Barcelona in 19 century, also in colonies of European countries in America. As a result, these ideal practices reveal something in common that they are trying to emphasize the concept of a ´unit´ in developement of a city to establish a rational system of public and privacy, but also make them tremendously dynamic in spatial ot formal quality. They took this ideal module for urban expansion and development of community clusters, but also develop various systems, aiming to deal with the requirement of diversity and urban context adoption.

However, only a few cities in history were built in this kind of history, for situations faced with in reality were complicated. Meanwhile, it takes always a long process to build a city, and its expansion as well. Thus, the idea of urban planning can be hardly to remain unchanged during this long period, when many of factors would have impact on it, such as regime changes, coastline changes or terrible disasters in nature. But we can still find some examples of it all over the world or in descriptions of bibliology.

Miletus, Hippodamus, 498 B.C.-408 B.C.

Miletus is one of the earliest orthogonal grid planning in history. It was originally influenced by Greek architect Hippodamus. The layout he created is called ‘Hippodamus Pattern’ in history. In genral, Hippodamus always divided land of city by orthogonal grid. But lines of grid have different width, which can classify main streets (5-10m) and secondary streets (3-5m). Basic blocks are defined by main streets, while secondary streets going through blocks to divide lines of townhouses. Moreover, the basic scale of block by Hippodamus is depended on different situations of cities, without a rigid number or the scale from public parts. The grid takes dominant position in urban layout, so that even public spaces and facilities are oliged to follow. Thus, Hippodamus’ grid planning has a strong capacity for adoption in many cities in ancient Greece and Roman Empire, such as Piraeus, Timgad, etc. To take Miletus as example, the basic block is a 180m*180m square. Each block is divided into 4 secondary blocks. Every secondary block is divided again into 6 30m*45m rectangles, which are dwellings for civillians to live in. However, in-

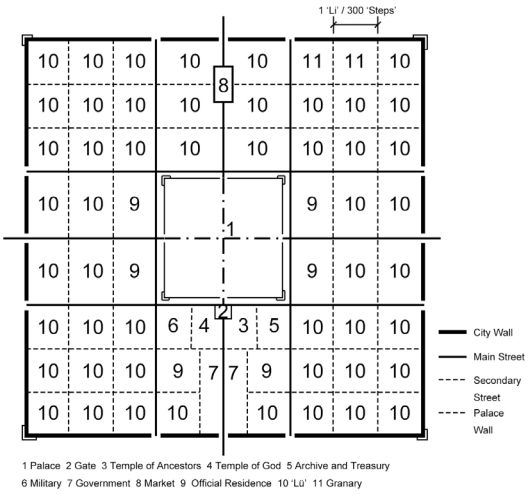


Figure 2.4 Module of Ancient Chinese Ideal Capital
Recorded in *Kao Gong Ji*

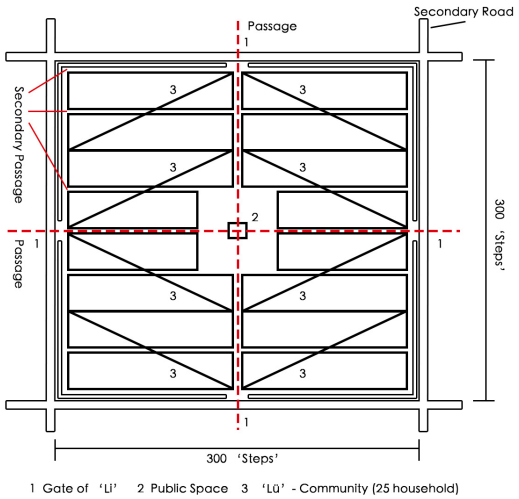


Figure 2.5 Block of Ancient Chinese Ideal Capital
Recorded in *Kao Gong Ji*

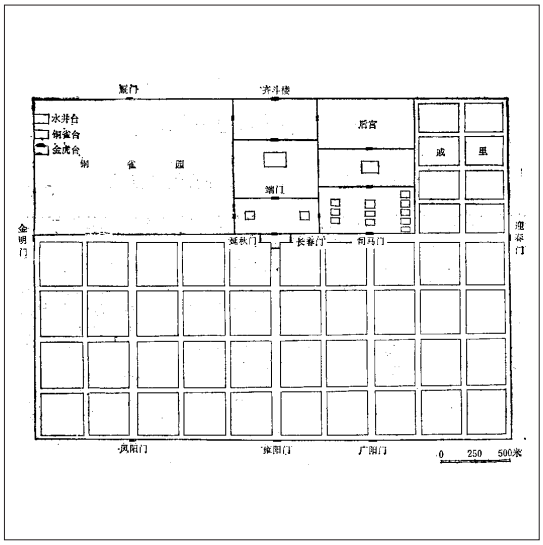


Figure 2.6 Ye City, China（Wei Dynasty, Three Kingdom Period, 213 AD. - 266 AD.）

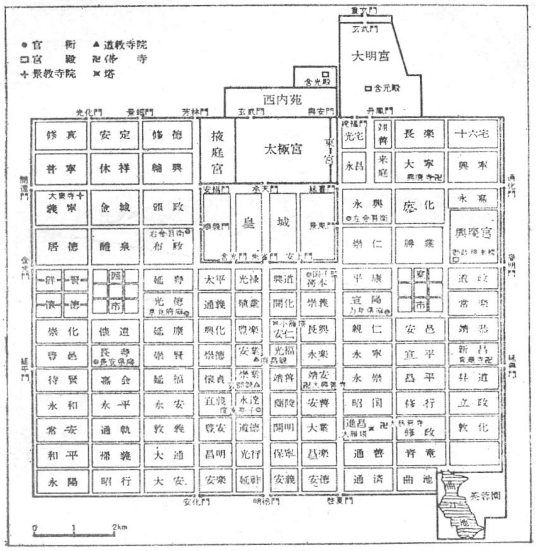


Figure 2.7 Chang'an City, China（Tang Dynasty, 618 AD. - 907 AD.）

Seleucia Pieria, Apamea and Laodicea, the block measures 112m*58m rectangle. It shows the possibility of diversity.

Although the general layout of Miletus is nothing different with other orthogonal grid plans, the layout of Miletus shows how it possible to create tremendously dynamic quality to the grid. The design originated from a background of orthogonal grid. Some public spaces and facilities, like temples, gymnasia, stoas, agoras and habours outwards, which can be easily founded out on the opposite page. They are like counterpoints and resistence of rigid grid background to emphasize. (Bacon, 1976)

The counterpoints have different interactions with the grid in different period. Tthe public parts built in ancient Greek preiod or Hellenistic period, they combine several basic blocks to be a bigger one, following the modulus and general directions of grid. The difference between two periods are only in scale and the composition of shape, like symmetry or free-floating space. But under the regime of ancient Rome Empire, the everyday activities were seperated into various sectors in different kinds of buildings, such as basilica, Roman Baths, etc, instead of a integral and enormous agora and buildings surrounding in ancient Greece. Some of these sectors didn´t fit basic grid very well, for their special angular layouts. So they adjust their peripherals to fit the grid.

Moreover, the basic block is never a solid prism. It is assembled by two lines of dwellings, with intervals or courtyards in them, but small enough only for sunlight. Besides, the passage between dwellings also provides chances for mobility and communications. Every plot in blocks has direct entrance to streets, which is nothing similar to ancient Chinese cities with orthogonal grid layout. As a result, the different levels of public spaces were established.

Ideal Capital in Ancient China

The earliest record of ideal capital module in China is from a chapter, *'Kao Gong Ji'* (means 'rules of engineering') in *'Zhou Li'* (means rules of Zhou Dynasty), compiled during 770 B.C. to 476 B.C. It shows the general rules and details of module capital in Zhou Dynasty. In general, as was geberated from the '#'-shape land system, in which land were seperated into 9 fragements like chessbox, the middle one was public, while 8 others were private. Thus, we can find that the ideal city is also divided into 9 parts in general and the central part is palace for ruler, while the adjacent ones are for ministers. Those far away from palace are for civillians.

There are tremendous differences between Ancient China and Ancient Greece, not only in details of blocks, but the economy and everyday activities. As is widely acknowledged, ancient Greece is famous for its democratic politics and commercial economy. Thus, there were full of communications in ancient Greek cities. People would like to spend most of daytime outside their houses in agoras or other public places. Thus the plot and courtyard is small. Even though they took same forms of or-

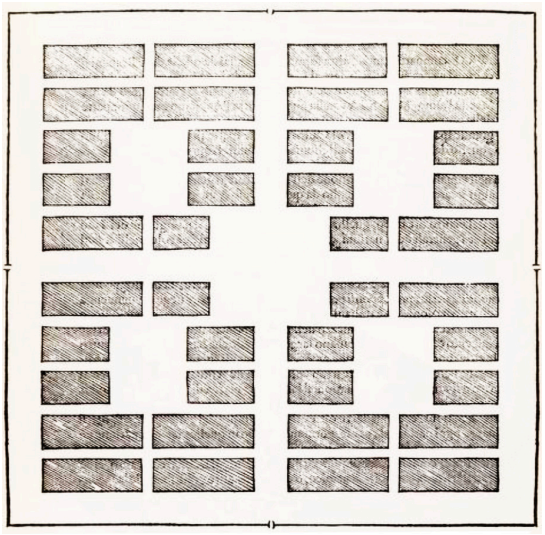


Figure 2.8 An Ideal City Block by Pietro di Giacomo Cataneo

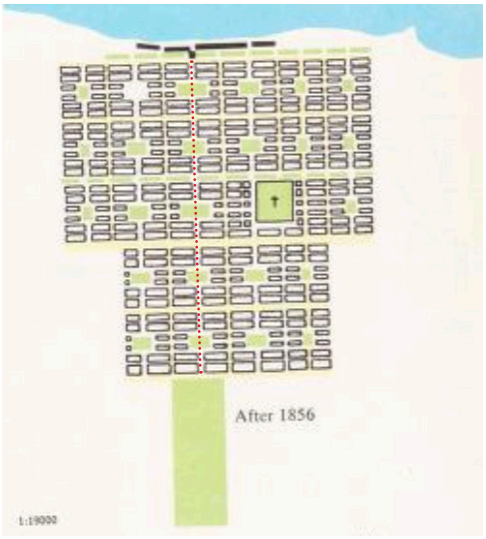


Figure 2.9 The Map of Savannah in Early American Colony, 1856

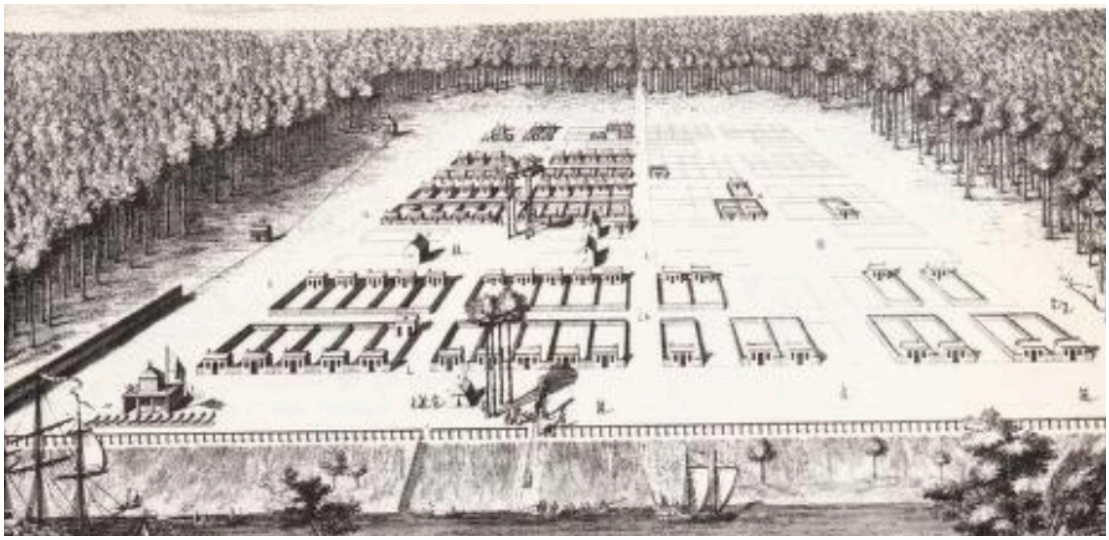


Figure 2.10 Engraving Drawing of Early Savannah

thogonal grid, cities in Eastern world can be absolutely different.

Ancient China was developed on agriculture economy for thousands of years. People live self-sufficient lives with few of contact with others. Thus, they always had relative big courtyard for growing vegetables, planting trees for silkworm, holding party with friends,etc. If someone has more money, they may buy larger courtyard to build private gardens for leisure. Ourdoor activities of civillians were seldom before Song Dynasty (960 A.D.-1279 A.D.). Comparing to plots in western world, average plot was large, while public spaces were small but crucial.

Although public places in ancient Chinese cities were smaller than those in western world, they occupied the most crucial position in the city. As people in ancient Chinese society were a strictly defined but floating system of rank from emperor, minister, government officer to civillian. People on different stage were ruled by upper stage of people. The structure of ancient cities are complicated and multilayered. Clusters on each level have different streets and municipal centers. As a result, there are five levels of mobility in ideal module of capital from top to bottom: main avenue, ring avenue surrounding palace, secondary avenue surrounding clusters, crossing street inside clusters and passages, while there are only 3 levels in the west due to the flat social structure.

In the smallest unit of city, called ‘Li’ in ancient Chinese, consisted of 8 ‘Lü’. Generally, every ‘Lü’ has 25 plots. So that when war occured, these 25 people could take one chariot. Meanwhile, the center of ‘Lü’ , called ‘Du’, is public space and the tower to deliever information about opening or closing the gates, festivals or commands from higher office. Actually, every level of clusters are organised in this way. Passages and crossing streets in cluster coonect adjacent clusters and public places. ‘Li’ can be flexible to adapt to different situations, such as minister residences, markets, storage or government, examples of which can be found in some famous capitals in different dynasties of ancient China, such as Ye city in Wei Dynasty or Chang’an city in Tang Dynasty. (He Congrong, 2007)

Savannah, James Oglethorpe, 1733

Published in 1567, *L’ Architettura* by Venice architecture theorist Pietro di Giacomo Cataneo, shows a ideal block proposal of orthogonal grid planning stimulating the discussion of urban units from *Ten Books on Architecture* by Roman Architect Marcus Pollio Vitruvius, which is on the opposite page. It reveals a clear structure of private plots, mobility and different levels of public spaces regarding the position of them in this block. It was the ideal module of city unit in Renaissance. Actually, Renaissance cities seldom took this module for urban expansion or development, as is mentioned before. On the contrary, after the era of the great nautical, western countries set many colonies in new world, following the orthogonal grid planning, such as Philadelphia by Tomas Holme in 1683 and Savannah by James Oglethorpe in 1733, etc. The module has a deep impact on layouts of

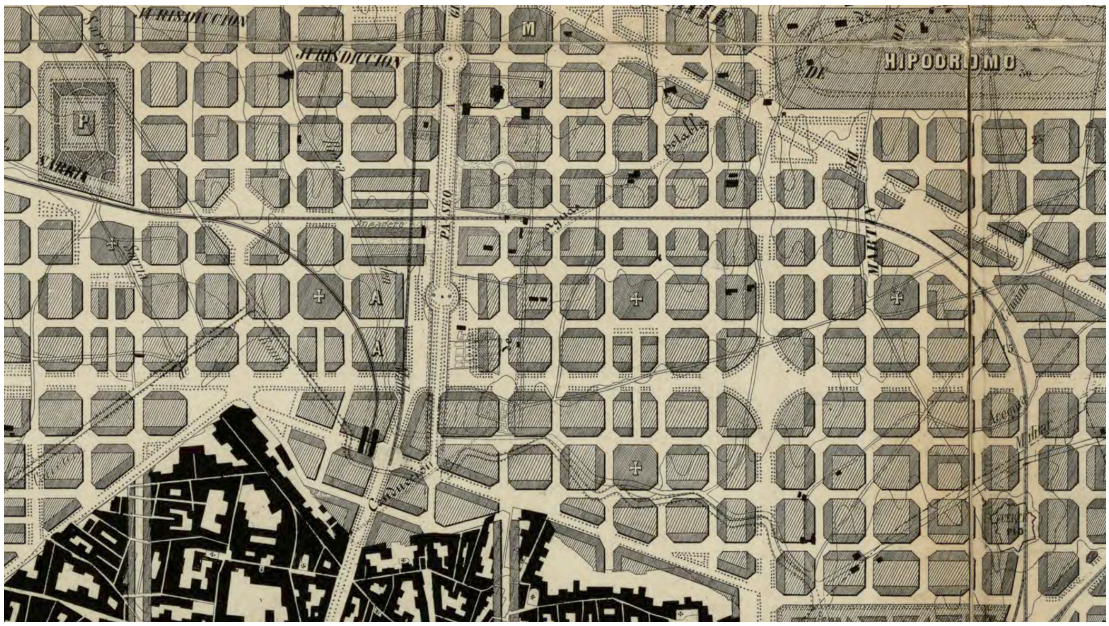


Figure 2.11 Original General Plan of Ildefons Cerdà´s Planning

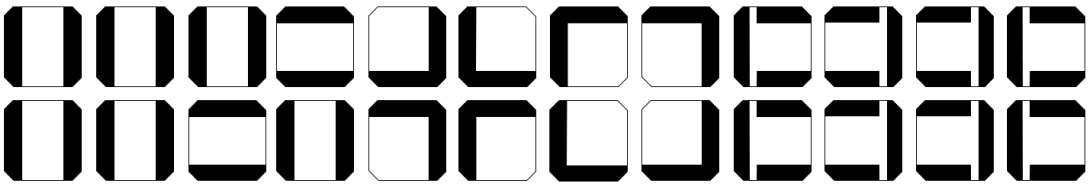


Figure 2.12 The Groups of Blocks in Cerdà Planning

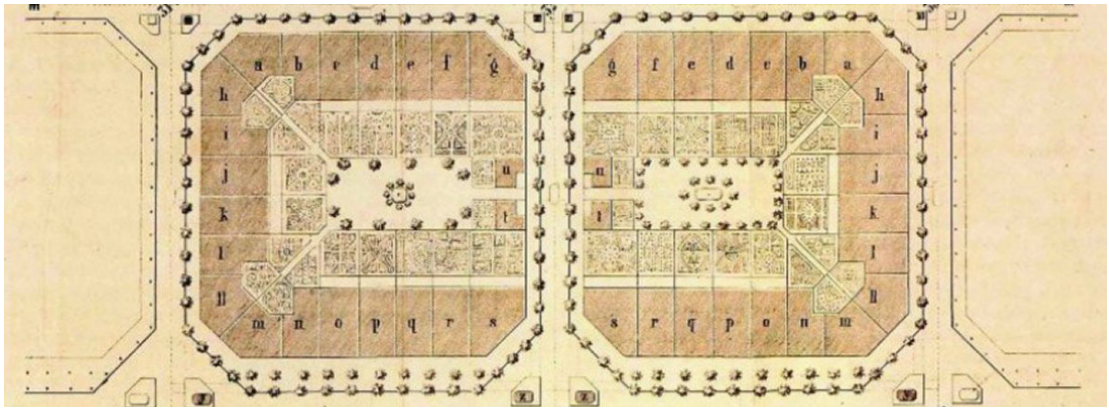


Figure 2.13 Two Blocks of original Cerdà Planning share one garden

New York City as well.

As for Savannah, orthogonal grid planning shows its ability of urban expansion and context adaption. Savannah originally appeared near the bank of Savannah River. Most of surroundings were forest. In general, as is shown in engraving drawing (Page 30), residential blocks were neatly organised in several rectangle clusters. But unlike rectangle clusters in China, those in Savannah were open to public. Even though, we can still find out the spine of the city, guiding the limits of rectangular clusters, extending from waterfront area to deep in forest. It defined the peripherals of living clusters. Nothing like Boulevard in Paris or Washington, axis here is divided into green squares and passages. This idea had controlled the expansion of Savannah for nearly 120 years.

Meanwhile, in each block, there are eight long cellular units and four short units for dwellings. A central green square was placed for community activites, closely associated with surrounded 12 units. Nowadays, we can still find them as gardens, markets or parking lots in Savannah. Among adjacent blocks, passages and secondary streets were used to establish strong connections between green squares of different blocks. The middle line of green squares, which is marked by red line in the Map of Savannah in Early American Colony, remained to be the axis of city all over the 18 century. It consisted a series of enlarged green squares and connected waterfront to a new park which has entirely different scale with green squares built before. After 1815, its scale was too broad to keep symmetry and restructured to fit in the border situations. As a result, another grid, consisting of green squares and connections, overlapping with the grid of rectangular blocks, shaped the basic rule of urban layout in Savannah. However, after vehicles became popular in cities, the green griding system was cut into fragments. (Bacon, 1976)

Comparing different types of orthogonal grid layouts in ancient Greek, ancient China and early American colonies. We can conclude that orthogonal grid planning can be a rational but flexible system of urban layout, providing a effecient public spaces on different levels. It also obesses special value in urban layout that we should pay attetion and preserve properly. Meanwhile, the rigid grid can be reshaped by public spaces and connections between them, regarding different situations standard blocks may faced.

Cerdà Manzana: Degeneration of Courtyard and Evolution of Peripheral

Barcelona is famous for its orthogonal grid urban planning. It has many similarities with other cities with orthiginal grid in history. Barcelona also developed a system of arrangement towards public spaces and private parts by designing rules on ' urban unit' for Barcelona.

During the mid 19 century, when industrial revolution was dramatically going on, the living conditions of Barcelona was terrible for its high density, traffic jam, lacking in sunlight and

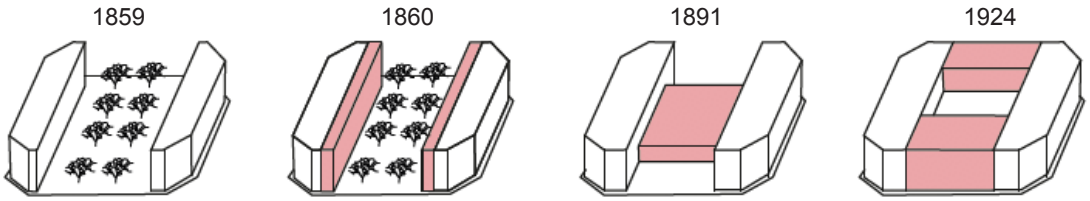


Figure 2.14 The Evolution of Courtyard

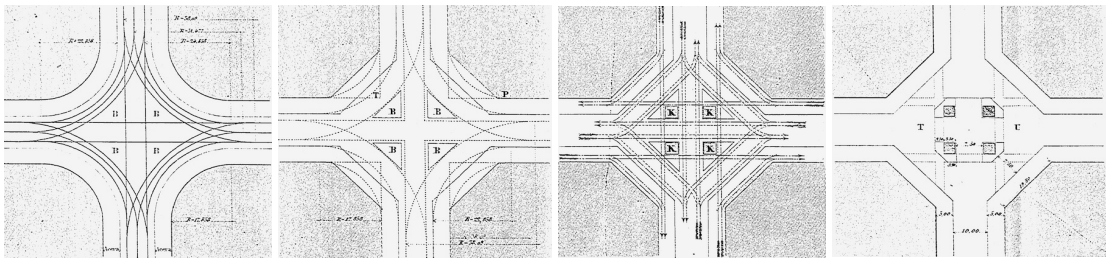


Figure 2.15 The Chamfer Corner of Cerdà Planning

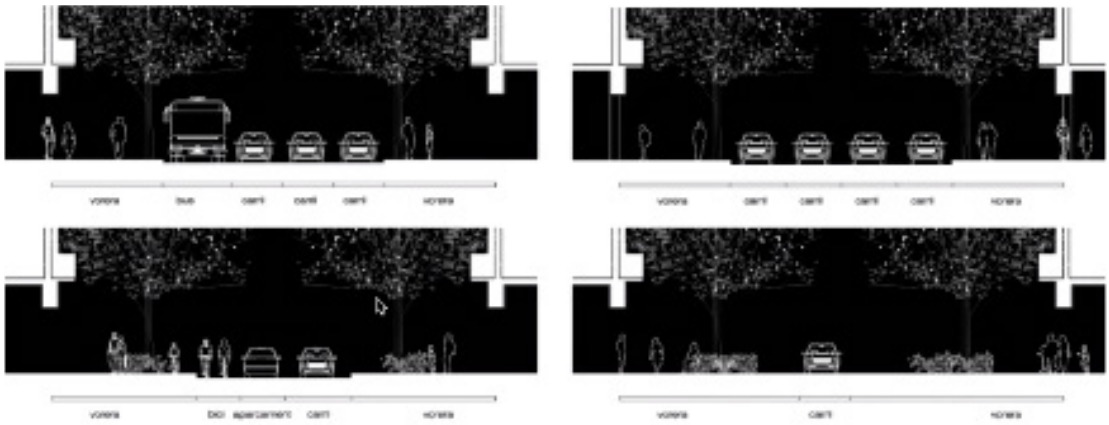


Figure 2.16 Ways of Transportation in Same Section Result in Different Street Life in Superblock

disease. The contradictions between civillians and municipality was growing fast, too. At the same time, socialists appeared to practise their thoughts here. As a result, in 1859, Ildefons Cerdà was influenced by these Utopians and came up with an idea for urban expansion of Barcelona.

In the general proposal of Ildefons Cerdà, it is obvious to see the orthogonal grid with standard blocks and orthogonal streets outside the old city of Barcelona. A clear system of public spaces are presented, from big parks occupying several blocks, small square with only one block and massive small public spaces in every block. Most of them were absolutely open to public but absolutely different in use for how broad in the city they can serve.

As for street, every five block has a wider road for main mobility, while others were narrow for pedestrians and urban street lives, in which pedestrian lanes on two side in total is same to that of vehicles in width. This module of living street is still alive in the process of urban transformations or development in other countires. Nowadays, as number of vehicles increasing sharply, Cerdà plan is confronted with same problems as Savannah used to be. Popular of vehicles seperated continuous urban lives into small fragments, which make more problems emerging, such as pollution, lacking of safety or decrease of activities in streets. Thus, streets in current Cerdà grid were transformed into different types to adjust pedestrian and vehicle lanes in width and position (street sections shown on the opposite page). It can define the street to be more suitable for urban lives or just for efficient mobility.

As for blocks, he divided the extending part into ´chessbox´ grid, in which he thought everyone would be equal to get fresh air, ample sunlight and enough space to live, which were also features of orthogonal planning. He conceived an ideal module, ' Golden Block', which was 113m*113m square in scale, and the surrounded road was 20 meters wide. Besides, on each corner of the block, a chamfer with 45° angle for he presumed that vehicles would be popular in the future, and it benefit mobility to make this chamfer corner. Also, we can find some other ideas of him where he placed four isolated islands with small pavillions in the street crossing for public usages. (Joan, 2005)

In the original thinking of Ildefons Cerdà, blocks of L´Eixample is not enclosed to be an isolated units with no interactions with urban context. On the contrary, Cerdà though each courtyard of block should serve 25 blocks in neighbourhood as public spaces or facilities. Actually, there are only two or three peripherals occupied by strip buildlings, while leaving an opening to urban context or adjacent blocks. In this sense, it is common with blocks in Savannah, which also contribute to public context by connections and openings. However, it is much more dynamic how blocks could change together with other adjacent blocks. As a result, it is free to choose where to place buildings among four peripherals so that blocks in original theory of cerdà are adaptive to situations they may face. Some adjacent blocks

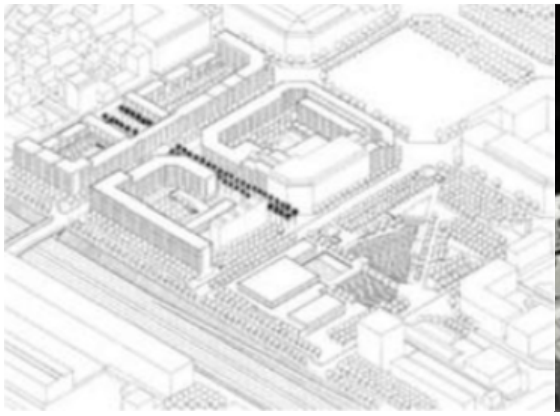


Figure 2.17 Clot de la Mel - CCRS

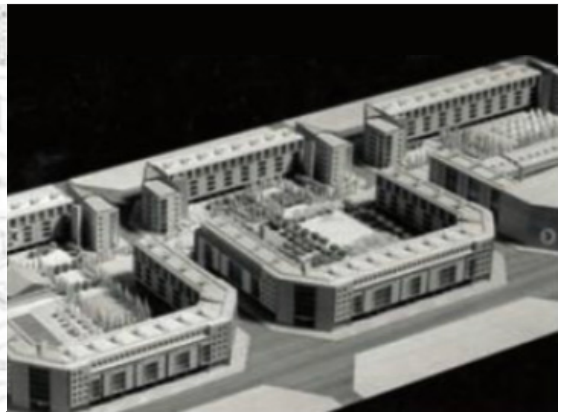


Figure 2.18 Can Torras - Carlos Ferrater

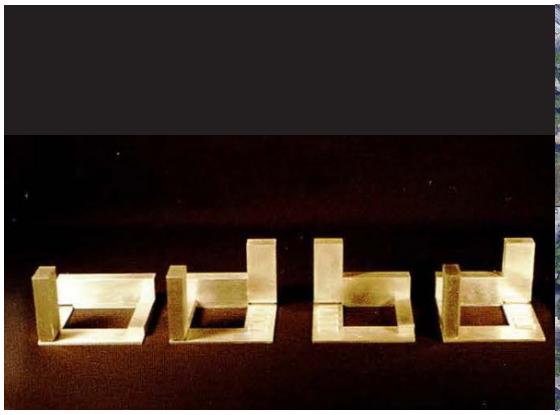


Figure 2.19 5 Seafront Blocks - SVC - Eduard Bru

Figure 2.20 Dwellings at Carrer del Treball

would choose to unite into a bigger block, with larger spaces for public functions or activities. There are a great number of combinations types, which can be found in the original general map of Cerdà planning and is also shown in the diagram below (Page 32).

Later then, the great demand of housing rised the density of Cerdà manzanas, accompanying with the increases in height, width and also the ratio of public space in manzanas. L´Eixample was converted form low density to high density. For example, the original proposal of block was 16m in height, but in reality, they were built up to 24m with underground floor to accomodate and cope with more populations and activites nowadays. Moreover, we can also find changes in peripheral of manzanas. The original public spaces scattering in manzanas had been enclosed as courtyards. Also, the inner interface of couryards changed a lot from straight lines to zigzags, while remaining the outline to be strictly aligned to each other, by unlimited occupation in land of courtyards. Some low height buildings appeared to occupy public land in courtyard or totally convert it to factories. Although, in some cases, the privacy of community activities has been guarenteed, blocks had become totally isolated fragments of city. while at the same time, the general area of urban public spaces decreased sharply.

Afterwards, ProEixample was brought out to return courtyards of manzanas to the public, in order to rebuild connections between manzanas and urban activities. It offers opportunities for current Cerdà blocks to stimulate the original thought of Cerdà planning in 19 century, but increase the number of courtyard gardens to serve for adjacent 9 blocks instead of 25 at the beginning. It will be introduced in details in next chapter.

New Cerdà in Poblenou: Courtyards Return to Public

Rethinking form of current Cerdà block in L´Eixample, Architects practice their thoughts in various projects in Poblenou, trying to make Cerdà blocks contribute to public spaces again. Generally speaking, there are some features in common among them.

Firstly, as was originally persumed by Ildefons Cerdà, courtyards of blocks were shared by adjacent neighbourbood. But it didn´t come true under the sharp increase in density and population. Thus, new forms of Cerdà blocks were developed to open to public, making contributions to public spaces and activities with courtyards and passage connetions. Actually, it is not a fresh news, regarding the reform of Cerdà courtyards in L´Eixample.

Serra-Vives-Cartagena, Eduard Bru and Carlos Ferrater share similiar ideas towards it, though practice in different ways. Three blocks located in Olympic Village were built by Carlos Ferrater, which presented his idea of reducing the depth of residential buildings and fragmentizing corners of them, in order to enlarge the area of courtyard,

Figure 2.21 Hybrid Cerdà Block Sharing Public Courtyard

Figure 2.22 Cerdà Block with Highrise Buildings

Figure 2.23 Can Framis / Vila Casas Foundation

Figure 2.24 New Campus of UPf in Poblenou

which was also practiced in 5 manzanas of seafront in Taulet. Meanwhile, he unevenly cut every block in two parts, with northern part much bigger than southern one. But they are not strictly seperated. Different types of special pavements were used to connect them together. Thus, the fissure is only for pedestrians rather than vehicles. Same method can be found in el Clot de la Mel by CCRS, 5 manzanas of seafront by SCV-Eduard Bru dwelling at Carrer Treball. Nowadays, it is quite common to reuse courtyard as part of public spaces especially in Poblenou, while a sense of privacy is still guarenteed for semi-closed peripheral, comparing to big parks or squares for entire city. (Bru, 1996)

Secondly, Cerdà blocks are never considered as islated cluster again. Instead, they are reorganised into integration in form and space, with some peripherals following the rules of Cerdà planning, rather than dealing with each block individually. Thus, pedestrian friendly streets and public spaces among them are constructed and shared by communities and urban context. In this way, people have more spaces to have everyday activities. Meanwhile, it can also enrich types of public spaces and quality of them.

Carlos Ferrater organised three blocks by courtyards. Although three blocks are similar in shape, courtyards of them are quite different with different facilities so that they are complementary to each other. The 5 seafront manzanas by SCV-Eduard Bru are closely associated with coastline. Every block has different ways of enclosure, but all of them are accessible to seafront line. Thus, a sense of diversity from different compositions of tower, stripe buildings and openings is created when moving along the coastline, under the rule of Chessbox grid layout. Moreover, symmetric towers in two adjacent block emphasize the axis of Carrer de Bac de Roda from inner part of Poblenou, acting as gateway of city. Meanwhile, dwellings stand by Carrer Treball show another method of connecting peripheral of several blocks into a building, with rules of grid unchanged. It can also avoid noise from Avenue Diagonal and safety is also guarenteed. (Roca., 2018)

Besides, there are some highrise clusters built under Cerdà grid as well. It can be seen as compromises made between requirements of development and traditions of Cerdà orthogonal grid, even for some details, like chamfer corner. But there are still some problems to deal with, for example, sunlight and visual privacy problems in such a 113m*113m square. Thus, some blocks are integrated for larger spaces for highrise buildings. It is how to find the balance of them that measures a lot.

There are also some industrial heritage which are 'DNA' of Poblenou. It is worthwhile to focus on how can industrial heritages joining in Cerdà blocks. Industrial heritages take different position in reforming Cerdà blocks, such as one of peripherals in new campus of UPf in Poblenou or public spaces and facilities such as Can Framis transformed as Vila Casa Foundation for exhibition, education and research. Besides, due to the differences of typography between old and new, some interesting spaces can be generated.

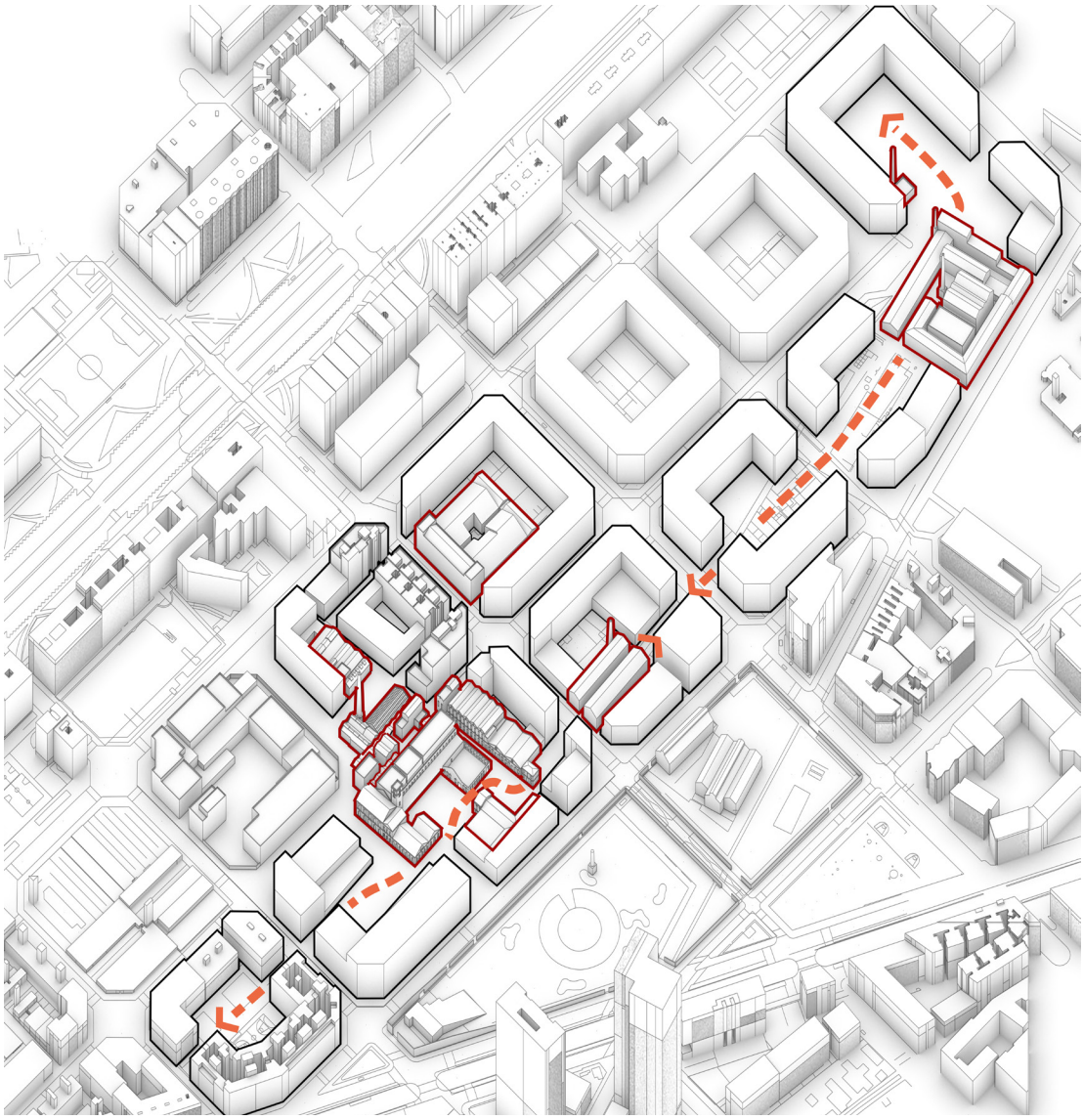


Figure 2.25 Adjust Height of Newly Built Part to interact with Can Ricart

Figure 2.26 Industrial Heritage Blocks to be Centers of Public Activities

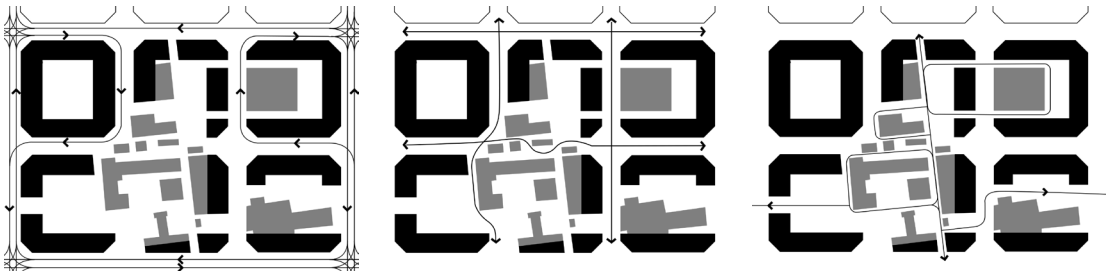


Figure 2.27 Mobility of Vehicles - Primary Pedestrian Lanes - Secondary Pedestrian Lanes

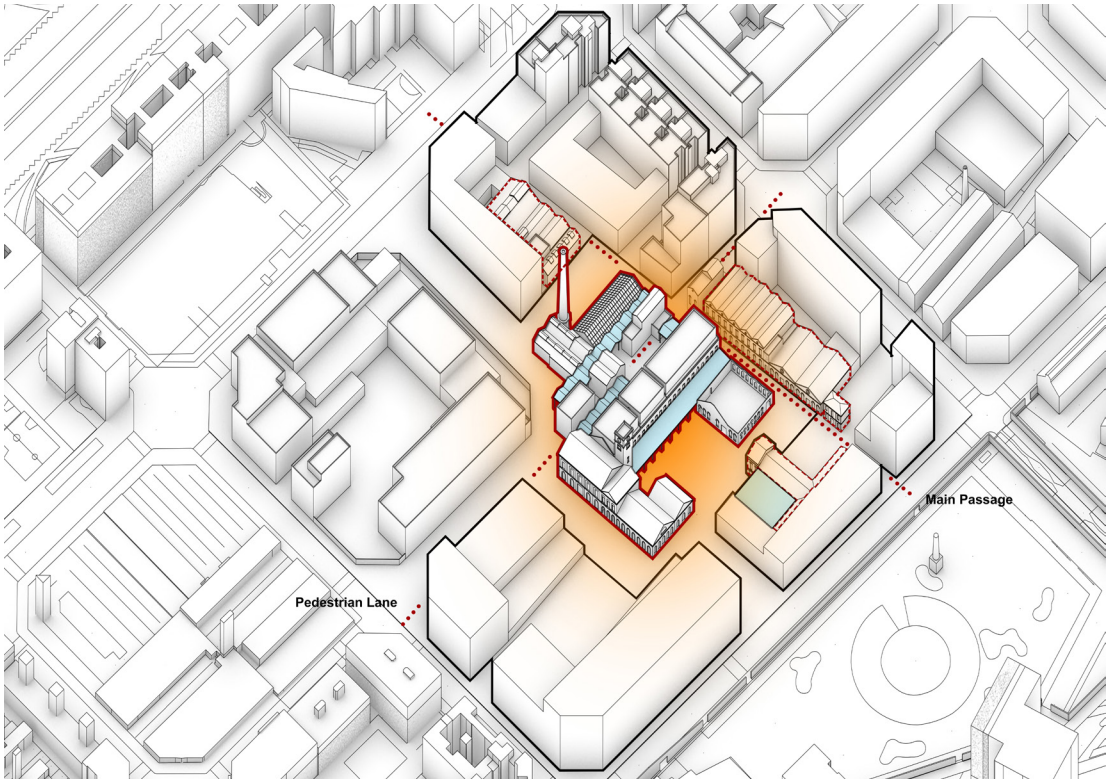
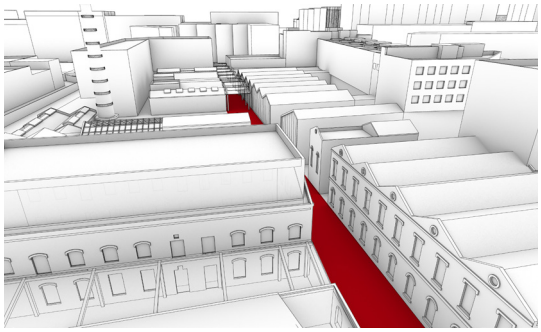


Figure 2.28 The Main Factory Transformed as Public Facility



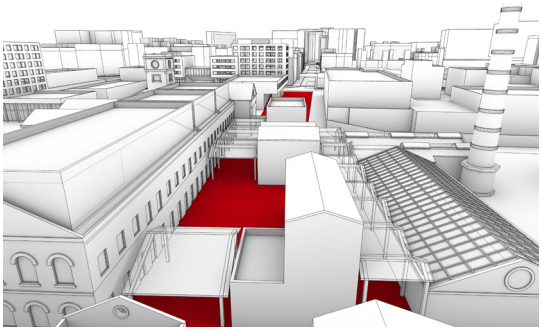


Figure 2.29 Main Passages of New Precinct

Figure 2.30 Unfinished Cerdà Grid of Current Can Ricart - Can Ricart Under Cerdà Layout

Firstly, according to the original proposal of Cerdà, blocks could conttribute to public activities by arranging the position of peripherals to be occupied by strip buildings. Thus, industrial heritages could be transformed as centers for public activites, together with courtyards or blocks they belong to. Secondly, interactions between blocks can be well organised to establish a system of public spaces by making different combinations of blocks, under general layout to be orthogonal grid.

Thus, we can emphasize the fragmental axis where there are many different kinds of industrial heritages, by refitting the peripheral buildings near industrial heritages for continuous experiences. Industrial heritages with public spaces would also be flexible elements of new Cerdà blocks.

As for Can Ricart, by organising positions of buildings in three blocks, a ´L´ shape integral courtyard could be created for Can Ricart and surroundings. The original main passage can be reused as connections between two blocks, while many of factories, such as parts of main factory can be taken as new peripheral for blocks, without strictly enclosure of them. It can provide a sense of privacy but also free-floating layout for dynamic spatial experiences in it. Buildings are also adjusted with some thresholds to connect with surroundings.

SMALL
LARGE
UNCOVERED
COVERED
OPENING
ISOLATED
OPENING
FISSURE
OPENING
COVERED
DOOR
CORRIDOR

Exceptional Cerdà

Horizontal Diversity for Humane Space

Horizontal Diversity: Collage of Interfaces
ProEixample: Corridor, Fissure, Door, Opening
Exceptional Cerdà with Industrial Heritage in Poblenou
Can Ricart: Affecting Cerdà by Space of Industrial Precinct

There is never perfect Cerdà Block in reality when facing with various situations. Exceptional plots of Cerdà exists everywhere, giving horizontal diversity to concept of Cerdà plan. And it also shows the flexibility of Cerdà in practice.

In L´Eixample, the interfaces of Cerdà blocks, including facade material, skyline, balcony..., are presented like jigsaw puzzle, accomodating a great variety of style, scale, etc. Meanwhile, the space of block also change a lot. ProEixample plan was launched to transform some peripherals and courtyards of blocks, in order to distribute every green space for 9 adjacent blocks, which makes distance between two adjacent green area within 5 minutes´ walk. Thus, some courtyards open to city again. Transformed exceptions can be classified into corridor, door, fissure and opening. These exceptional plots make Cerdà blocks diverse and vivid.

Poblenou has this treature in its nature. As is mentioned in Chapter 1, there are Unfinished Cerdà blocks full of industrial heritages, including chimeny or water tower, factory, precinct, etc. These industrial heritages, with fragments of old layout, are scattered and sunk in rational Cerdà grid. Some have been transformed and emphasized by architects, in order to reorganise grids today with industrial heritages for better public spaces to be highlights and 'ID Card' of Poblenou blocks. In order to achieve this, some exceptional plots were applied to them.

There are different kinds of industrial heritages in Can Ricart. It is supposed to be center of adjacent area, and also the memory of it. In this chapter, we mainly discuss about how to transform surrounded Cerdà blocks to emphasize and have good interaction with details of Can Ricart. Thus, the old layout of Can Ricart will be respected to preserve spatial features and open Can Ricart to nearby context within the concept of Cerdà by exceptional plots.

Figure 3.1 Current Peripherals of Cerdà Blocks

Figure 3.2 Current Peripherals of Cerdà Blocks

Horizontal Diversity: Collage of Interfaces

In original version of Cerdà planning, diversity of urban spaces were created from larger scales to details. In reality, Cerdà blocks in Barcelona show absolutely different forms in blocks and buildings but consistent in some aspects, comparing with the original concept of Ildefons Cerdà. As is mentioned before, public spaces are of diversity by different kinds of combinations of blocks. It is mentioned in last chapter that every block was occupied by two or three strip buildings on several sides but leaving most of land to be public courtyards, together with other courtyards of adjacent blocks. Ildefons Cerdà believed that it could help ease the land use stress from old town of Barcelona and improving rights of workers to have equal chances for private spaces, fresh air, sunlight and accessibility of public areas. However, it didn´t come true when set for realizing the plan. Because of the resistance of the rich, the socialism idea was not carried out completely. The blocks were built enclosed by buildings. In the end, diversity of general layout didn´t come true later.

However, diversity of Cerdà blocks eventually come true in details. Nowadays, we can find that blocks in L´Eixample can be various when wandering in the streets, looking at the facade of blocks. It originated from points of Ildefons Cerdà which allow people to arrange their buildings and public spaces individually, in order to save money for municipality and project. This policy deeply influence the evolution and development of these orthogonal blocks. On the one hand, it encouraged people to take care of public spaces conciously. So that people could built their plots by their will. Also they were admitted to decide inner ground land usage and the buildings standing by. However, on the other hand, it brought difficulty in management. The height and depth of buildings quickly exceeded, which used to be 16 meters high but eventually finished in 24 meters. The neat interfaces of courtyards were also broken into fragments, due to the different thickness of peripheral buildings. Even some courtyards were vanished due to irregular land merger and additional constructions for other activities like industrial buildings. Moreover, plots of in a blocks can seldom been constructed at the same time, or some of them has been reconstructed afterwards. Blocks today are integrated in peripheral but various in plots.

As a result, there are a great variety of facades specialized in scale, material, ornaments or division of facade, etc. The collage of plots and skyline create a kind of orthogonal block, nothing like ideal city but full of principle and thrilling unity, such as EUR District. Instead, great street experiences and activities are created under this kind of horizontal diversity.

Meanwhile, due to the compromises in high density and enclosure when ideas of Ildefons Cerdà coming into practice, Barcelona has become a compact city with nearly 16,000 residents per kilometer square and only 6 kilometer square green space for each person. 95% of land is covered by buildings, roads and asphalt, with only 5% were

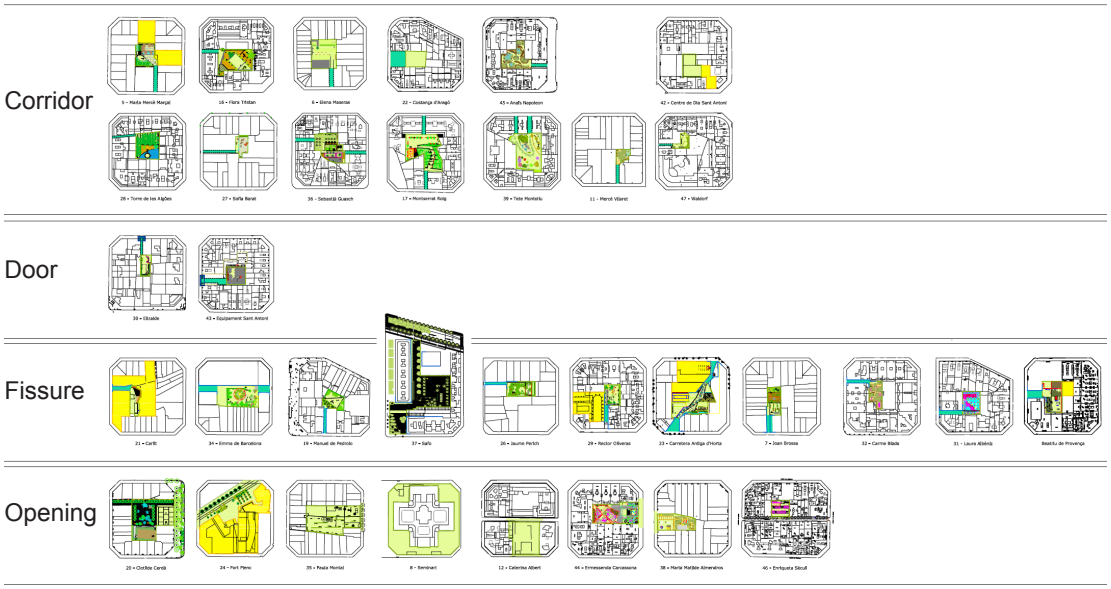


Figure 3.3 A Classification of Public Spaces in Cerdà Manzanas

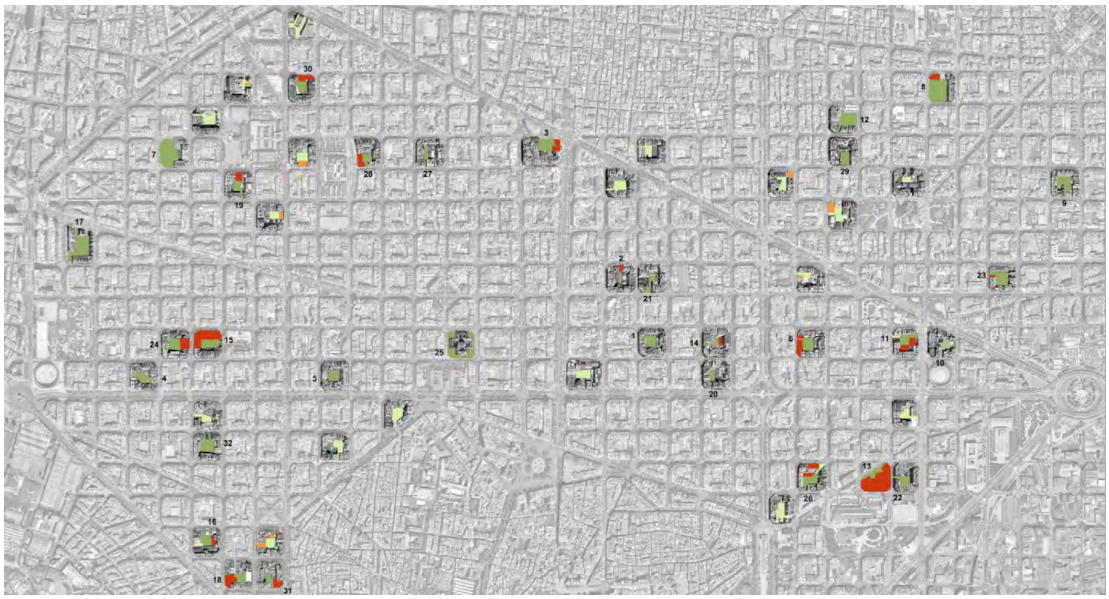


Figure 3.4 Projects of ProEixample

bare land in L´Eixample. Barcelona become one of the most compact cities all over the world.

Thus, there were great demands for green spaces in L'Eixample. From 1980s, the area of gardens are increasing continuously. And many courtyards of blocks were reopened to public. Till now, there are already 70 more gardens for public by transforming enclosed blocks. It is a good idea for not only continuing the current shape of blocks but preserving old elements, such as chimneys or fragments of factories, which are discussed in the former chapter. Besides, It also created chances for enhancing horizontal diversity by special plots of facade connecting both inside and outside context. Sometimes these plots can also be taken as main entrances of the garden, while still accommodating dwellings in the upper floor. The special plots can be classified into four typologies, which vary in functions and perspective views. (Safo., 2018)

ProEixample: Corridor, Fissure, Door, Opening

In general, there are four types of exceptional plots mentioned in former part: corridor, fissure, door and opening. They are defined by features in sections or scale, and has different functions when dealing with surrounded situations, in mobility, visual connection, and the integration of shape. They are discussed below.

Door

Door is a kind of special plots in Cerdà block. It provides accessibility to inner courtyard. A garden with a door plots can be well arranged while opening to public. The open time of inner public spaces can be limited to daytime or some special point during festivals. It can shelter the community from noise outside and guarenteed safety. Meanwhile, instead of just a fissure in a block, door plots can also have same functions as other normal plots do.

Sant Antoni can be a good example to be the door plot of a Cerdà block in L´Eixample. It revitalized the abandoned urban area and retrieved the inner courtyard to public by its urban facilities and public spaces it included. The facility buildings of Sant Antoni Garden are including a library and a civic center for retirement home and facade of public space. Because of this kind of synthesis, the courtyard public space is fullfill of richness of activities from adolescents to the elderly by providing places for them.

Library is a good filter for sunlight and people. It complete the interval of block but with an obvious difference to be recognised easily. It is come up with 2 parts, two volume attached to each side of buildings, and two boxes interposing two sides of library. Two main volumes are of absolutely different functions and the thicker one is main body of library, providing places for lobby, atrium, main stair and elevator and cafeteria. The thinner one is mainly used for emergency stair and service functions like storage. Two boxes between them are reading rooms for different users. The lower box connects activity room for children. Thus it is reading room for kids, while upper box with two

Figure 3.5 Door - Sant Antoni - Joan Oliver Library - RCR Architects

Figure 3.6 Door - Sant Antoni - Joan Oliver Library - RCR Architects

storeys is for adults. Moreover, the shape of box is also design to accommodate a stair reading room, which also connects two levels of it. The special shape in section could introduce sunlight, sky and scene of inner garden to penetrate from both side of peripheral, together with a black mirror like material to have good reflections. It eases the feeling of narrow and pressure from boxes when entering the door, making it more transparent between both sides.

Another part is the retirement home for elderly, although it has two storeys for a lot of activities, it maintains the same height with other original buildings nearby, for half of it is hidden underground, with a deep gap to introduce sunlight and reduce changes to structures of original buildings. Meanwhile, the retirement home is connected with the ground floor of library, managing to improve the facade of new public spaces. It looks like a series of patches for ´scar´ of this block, combining old and new part into integration.

Corridor

Corridors are common in Cerdà blocks in L´Eixample. It uses tunnels and passage to introduce people into the courtyard. But as it is always small and narrow, connections are not strong enough for public. The entrance is not always obvious as door plots, with gates for courtyard inside. So it is always for community or private usages. However, there are still exceptions to be urban public spaces.

Torrre de les Aigües, together with the block of it, is one of the earliest Cerdà Manzanas in Barcelona in 19th century. In 1862, Josep Cerdà was admitted to build first Cerdà Manzanas in L´Eixample. But the water supply system was not avaliable as he started the process of construction. So municipal administration delegated Josep Oriol Mestre to built 24 meters water tower to cope with the requirement of water suppliment. As height of blocks growing, another storey was added to increase the water pressure for further area usage.

After the promotion of tap water, the water tower was abandoned. In 1987, the courtyard was retrieved to transformed as garden space for public. A waterpool was set near the water tower for ´water theme´. Many of visitors including residents come here for fun. But they can not directly enter in courtyard from peripheral buildings, for courtyard is enclosed by solid walls. Besides, rather than eyeball catching, the entrance is under a normal dwelling, with only a small label to tell the name of the courtyard. Inside of it, a gate is set to have good arrangement. Visitors can easily observe part of the tower in the corridor.

Fissure

The fissure always emerges from the renovation process. It contains some regular or irregular intervals dig out from a complete Cerdà block. Thus, comparing to other kinds of plots mentioned above, it seems to be so narrow that less ´destructive´ to the original shape of block. Besides, both side of

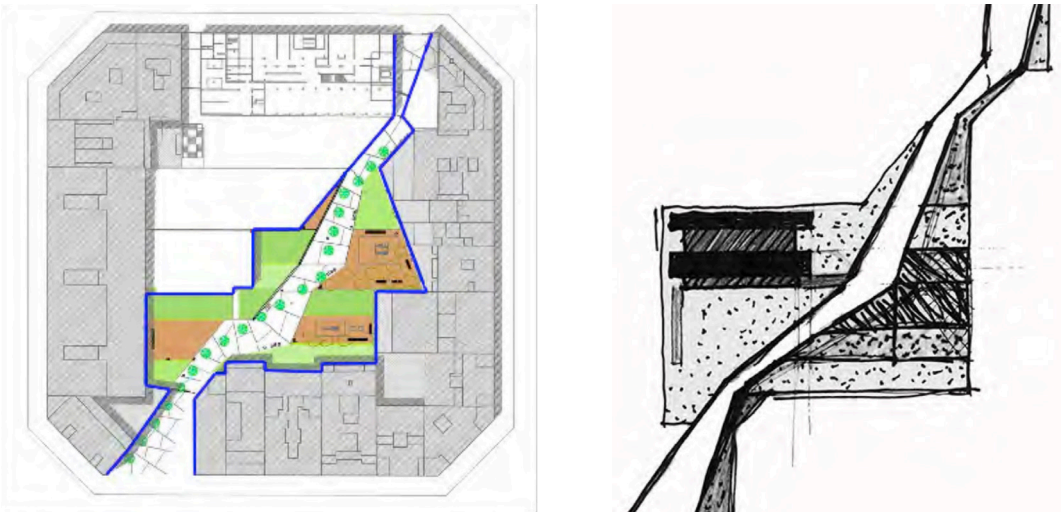


Figure 3.7 Fissure - Antiga Carretera d´Horta - Ferrater - Social Center / School

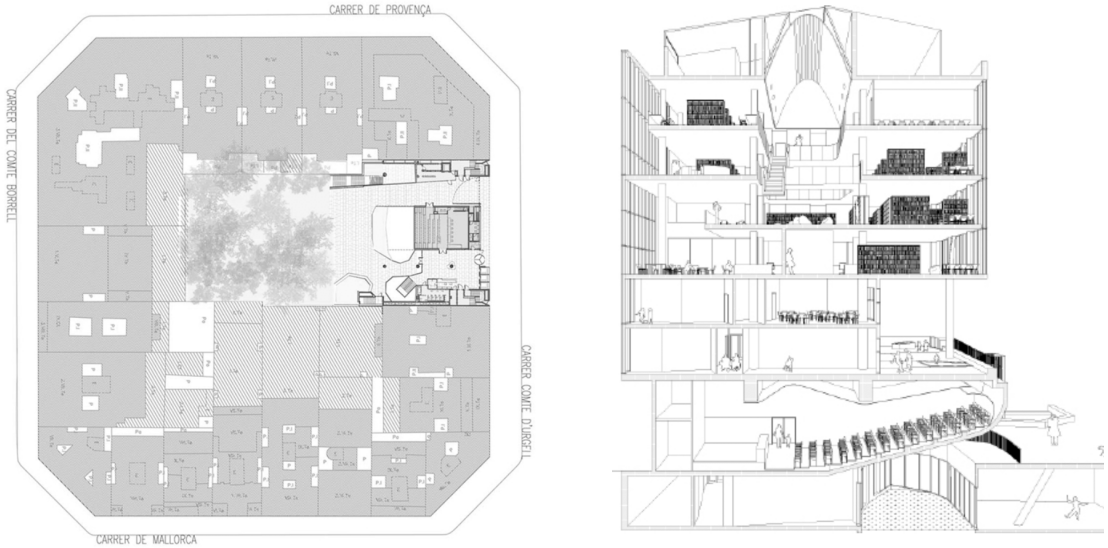


Figure 3.8 Opening - Library, Civic Center, Auditorio - Rahola Vidal - Social Center / School

fissure always has good interactions in shape to be a integration. As for function, fissure is similar to corridor, which allows people to pass through the peripheral and connects inner garden to outside nodes. The fissure provides good chances for connections in visual and mobility, which is also same to corridor. However, the difference is, which is crucial, corridors are similar to doors, which are covered by building volumes, while fissures are not. Therefore, corridors are better than fissure without disturbing shape too much.

Antiga Carretera d´Horta is a renovation project designed by OAB - Carlos Ferrater. It follows the original passage, Carrer Horta, special designed to reaffirm the old mobility as a relaxing pedestrian path with landscape on both side of it. Designer took different pavements and the changes in typography to influence the activities in different part of the fissure. A social center is built in the middle of fissure for community activities and skill training, which is the core building and highlight of the courtyard.

Besides, the path of Carrer Horta has been reshaped into zig-zag, in order to slow down the movement of pedestrian and enlarge the staying of people wandering here. In this way, the fissure here enhances the spatial experiences of pedestrians by changing mobility and types of activities here. Meanwhile, without building volumes over the entrances, there are good visual connections from Calle Alibei in the south to the social center, which is also better than just put corridors here. Connections of visual and mobility can be strengthened together.

Opening

Opening is the largest kind of exceptional plots in current Cerdà blocks. It creates strong connections between both side of peripheral. Openings are caused by many factors and reasons, such as independent public facility buildings (ex. Seminari), roads (ex. Fort Pienc), or pocket gardens (ex. Jardines Caterina Albert). Thus, openings is almost urban public spaces to be entrance square, urban parks, urban square,etc.

Jardines Ermessenda de Carcassona is a strongly connnected urban pocket garden, like Jardines Maria Matllde Almendros as well. On the ground level, the opening allows penetration from urban street to this pocket garden inside, but using solid walls to cut off any connections in mobility to protect safety of residents. However, in other words, it deprives private community spaces for residents.

Unlike Jardines Maria Matllde Almendros, which is absolutely a open space facing the street, Jarines Ermessenda de Carcasson contains a pocket garden and a civic center including a child library, kindergarten, culture center and grand hall is built over the entrance of opening. The building is a vertical composition of five functions above. They share common ground level spaces and have interactions with urban context, with some terraces facing streets and garden inside. It revitalize the public space by attracting people, with public

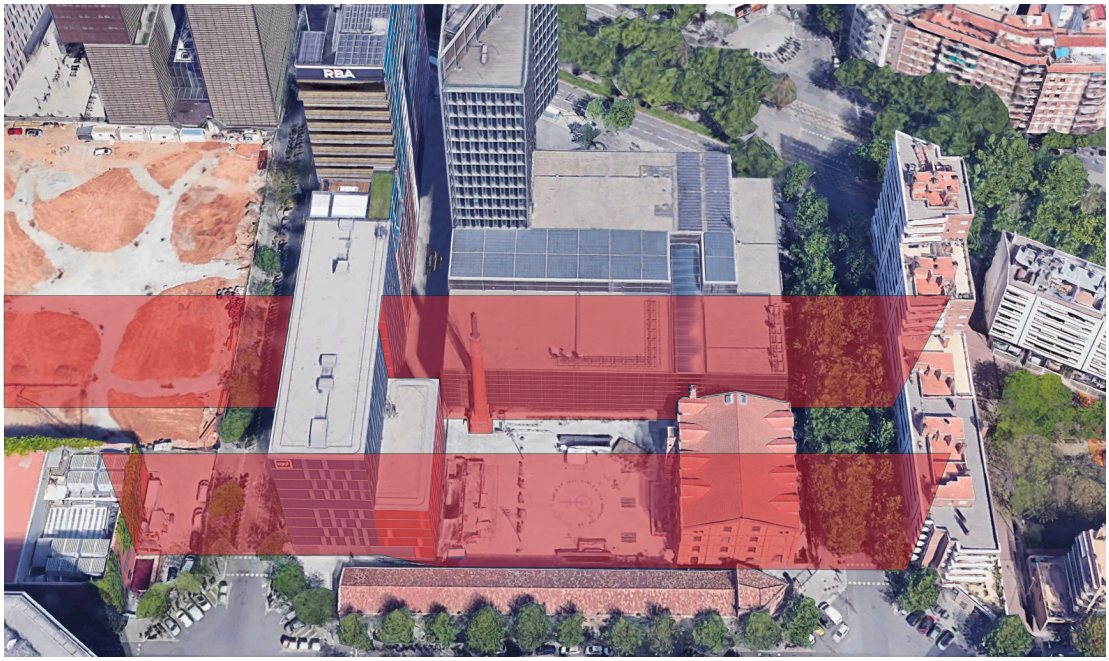


Figure 3.9 UPf Poblenou Campus - RQP Arquitectura

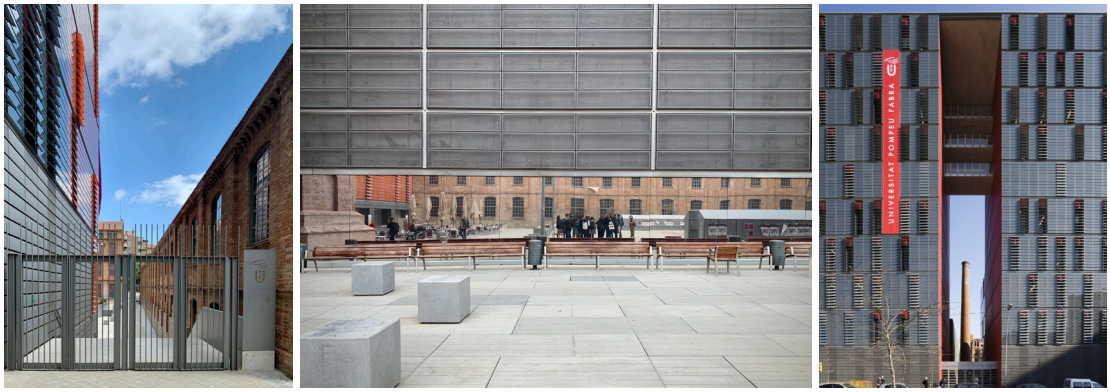


Figure 3.10 The Passage, Sunk Square, and Fissure for Visual Connection to Chimney

facility. It is exactly suitable for the renovation of Can Ricart, to be transformed as a precinct of urban facilities, with different kinds of public spaces for activities.

Exceptional Cerdà with Industrial Heritage in Poblenou

Poblenou is full of industrial heritages, including chimneys, water towers, factories and precincts. During the process of Cerdà griding expansion, many of industrial heritages was reorganised in Cerdà blocks. Thus, the typologies of exceptional plots are still applied to cope with the preservation project. They have different effects in prespective views from pedestrian level. They can be taken as doors, corridors, fissures and openings for industrial heritages to be suitable for context nearby, urban activites and proper arrangement of them.

Ca L´Aranyó - New Campus of UPF in Poblenou, Fissure Plot and Door Plot

Ca L´Aranyó was the first factory constructed under recent created Cerdà grid planning. But the block wasn´t completed until recent years. The original factories are just following the overall configuration of blocks. It was originally a group of factories for textile mill, including buildings around perimeter and the boiler at the center. There are some characteristic details in them. Historic façades are full of Catalan arches, columns and architraves which are valueable. The shape of building stands at the perimeter also strictly obey the rules of Cerdà with chamfer corner. A symbolic chimney is still preserved well in the courtyard. It has been abandoned for years but soon to be reused by nearby power station which is at the west entrance of the campus.

All of buildings in this new campus are set around an original sunk square, which is 1.8 meters lower than the level outside. It connects various parts of surrounding, with ground level square and underground interior space. The mirror material on the façade of newly built part reflects the historical façade of old factory, which complete the historic courtyard in visitor´s mind. Meanwhile, it is usually good place for various activities, such as festivals or processions, or temporary street arts happening here. Meanwhile, campus of UPF is always open to society. Thus, connections between both sides of campus are supposed to be recognised.

It emphasizes connections from Jardines Ca L´Aranyó to Carrer de la Llacuna and Jardines Ada Byron by fissure and door. Three fissures of passages, including the original one, introduce pedestrians to go through the block or wander around inside the courtyard. Each fissure has a gateway for campus arrangment, so that campus can be closed for certain dates or special period when it needs to be closed. Meanwhile, a special designed entrance is in the middle of the building standing at the west side of perimeter. The entrance is like a hole dig out from the complete building, with two suspended boxes for connection bridges between two sides of it. This door plot is

Figure 3.11 Opening for Chimney Square of Can Saladrigas

Figure 3.12 Opening for Sunk Garden of Can Framis

narrow but tall in proportion, which is similar to the chimney standing at the back of the building. Thus, the chimney can be exactly observed in Jardines Ca L´Aranyó. The attractive industrial heritage is emphasized by door plot like a painting frame on the interface of the garden. It enhances the connection between garden and campus, telling the story of old factories and the new campus.

Can Saladrigas - Biblioteca Poblenou Manuel Arranz, Can Framis - Fundació Vila Casas, Opening Plot

Can Saladrigas was founded in 1858 and rebuilt in 1884 due to fire. It was the first factory to conserve according to the archive of Poblenou. It is so important to Poblenou that even there is a street named after it, called Passatge de Saladrigas. After the construction of Carrer de Pujades and Carrer de Bilbao, most of the original precinct was destroyed by the municipal speculator except main four-storey factory and two chimneys. The old factory was transformed into a complexity including library, cultural center, senior citizen center, etc.

In front of the main factory, Carrer del Joncar goes by a roundabout route around the square in front of Can Saladrigas. In the square, one of chimney from Can Saladrigas is conserved well, although the boiler and the gate has been demolished for a while. However, together with the chimney, the square became the main entrance of Biblioteca Poblenou. It is currently the active urban square with people taking activities. Meanwhile, the ground floor of main factory was also transformed into a big hall, with French windows in original arches of façade. It emphasizes the connection between the entrance square to interior space of the main building. Thus, the opening for chimney square and reorganization of ground floor introduce people from urban space to this cultural center.

Opening plots also have same effect in the renovation project of Can Framis. It was originally a group of textile finishing factories and is now transformed as a Catalan art collection fundation founded by Vila Casas. Façades of two old factories are coated with grey mortar, emphasizing the sense of unity with newly added concrete volume for connection.

The site, which is similar to that of Ca L´Aranyó, is also 1.5 meters lower than level outside. Thus, the transformation project designer, Jordi Badia, presumed a circle of garden with lawn, bushes and deciduous trees, surrounding the old factories to make it isolated from dense urban context. A narrow path detouring down to the lower level of factories, leading vistors gradually into the entrances of factory precinct. It shelters vistors to be totally absorbed into the atmosphere of Catalan art pieces, forgetting the noise outside. It is exactly the opening plot that is designed to be the sunk square and garden for entrance, but taking advantage of typography very well. Meanwhile, the opening is limited into the outline of Cerdà grid, which also shows the flexibility for coping with different situations and requirements of exceptional Cerdà block faced with.

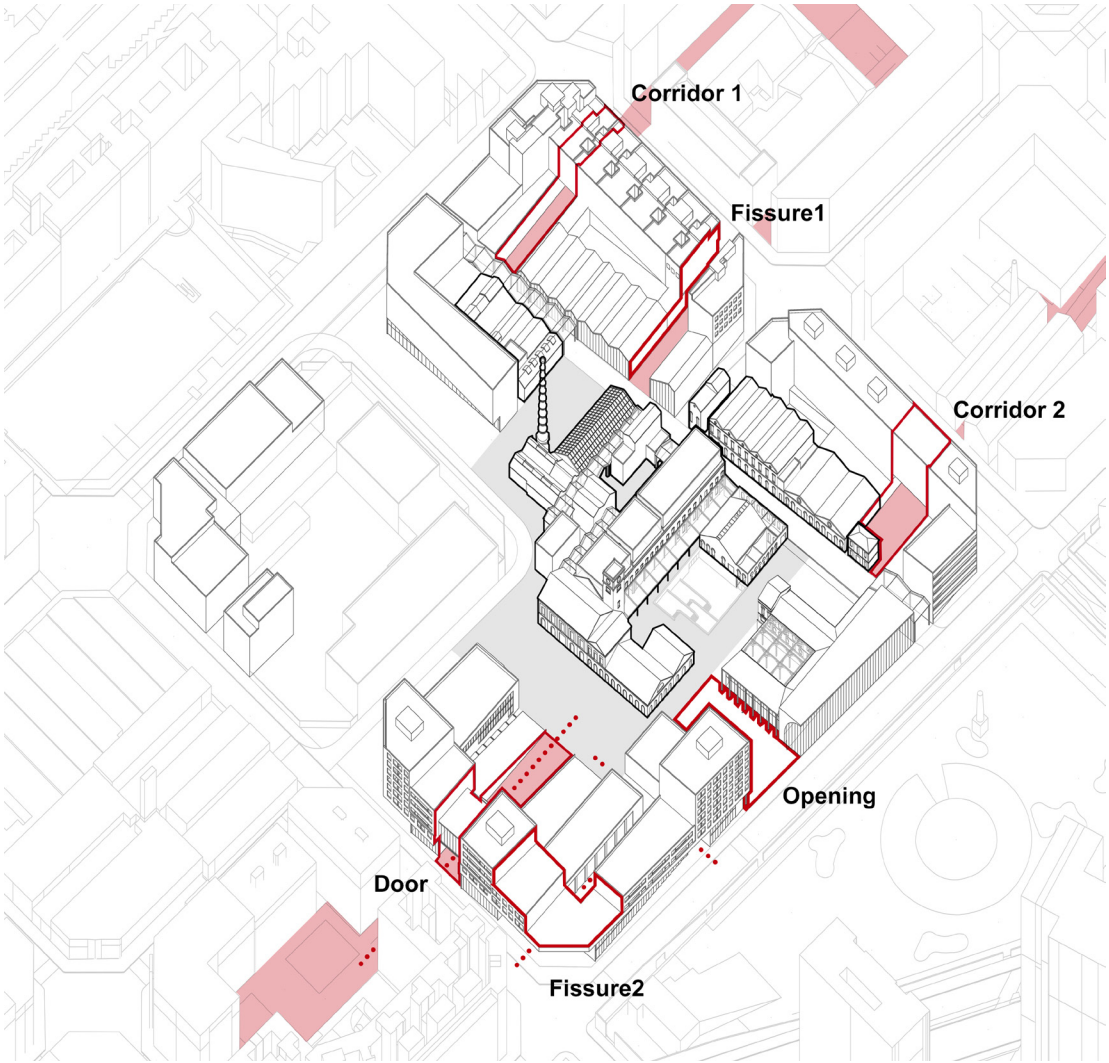


Figure 3.13 orizontal Diversity from Exceptions of Peripheral

According to studies above, different types of exceptions can be applied to different position of peripheral, in order to strengthen the connections in form, mobility and visual. Together with changes in façade and skyline, the horizontal diversity can be continued here.

But each of them varies in diffrerent functions. Doors are used to be small entrance connecting nearby space nodes to come up with a continuous experience of industrial heritages instead of isolation of them. Meanwhile, it doesn't mean that peripherals are always supposed to be cut in to fragments. Instead, doors can be good visual guide to industrial heritages from street view or from other spaces nearby. Factories can be revealed partly to maintain a sense of mystery.

Opening is set for main gate for the whole precinct, facing Central Park of Poblenou, directly introducing people towards main factory of Can Ricart. Some old passages can be preserved or fixed, such as passage 1, some other small passages following the old layout can also be created to strengthen the connection between urban context and inner courtyard.

Fissures are created mainly for visual connections for some tall elements in Can Ricart, such as the bell tower and chimney, which is transformed as a big thermometer to serve surroundings. Meanwhile, fissure 1 is also taken as small entrance for mobility, but it is not among main entrances.

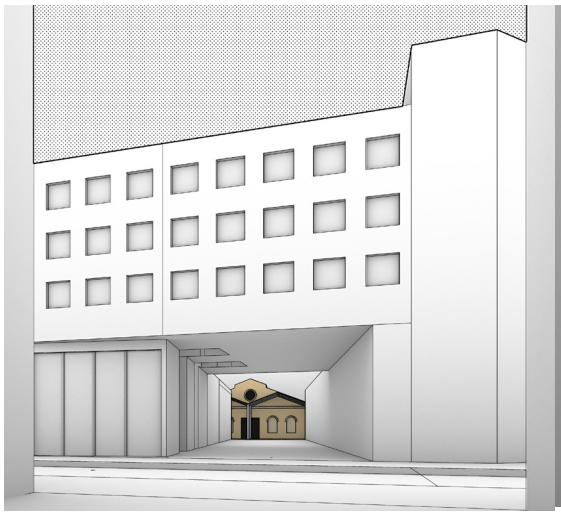


Figure 3.14 Corridor 1

Figure 3.15 Corridor 2

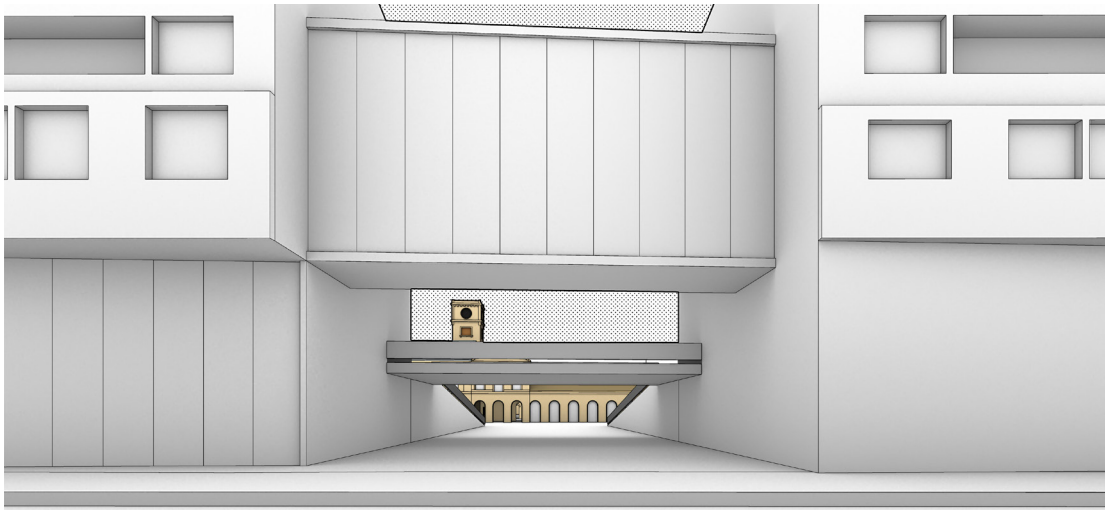


Figure 3.16 Door

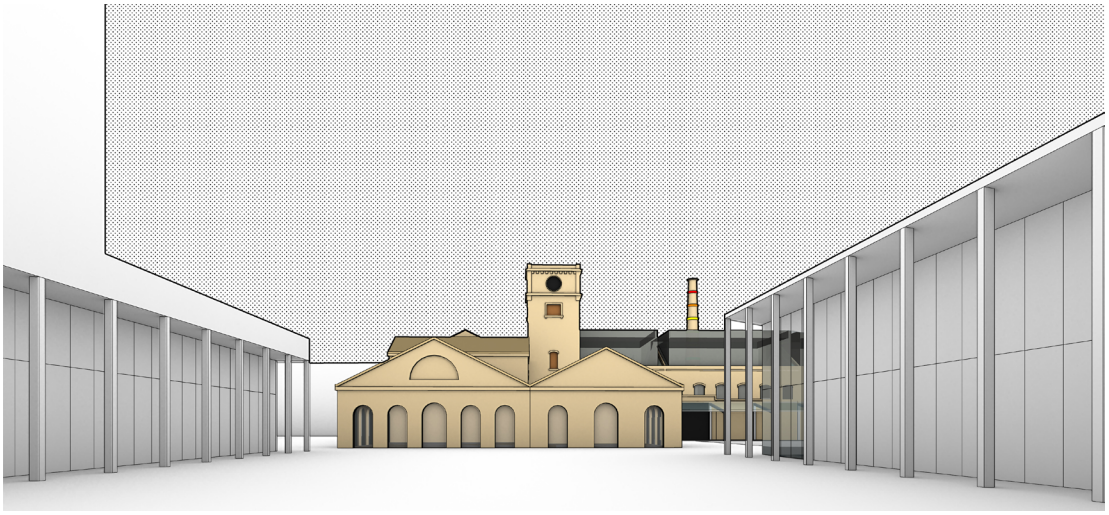


Figure 3.17 Opening

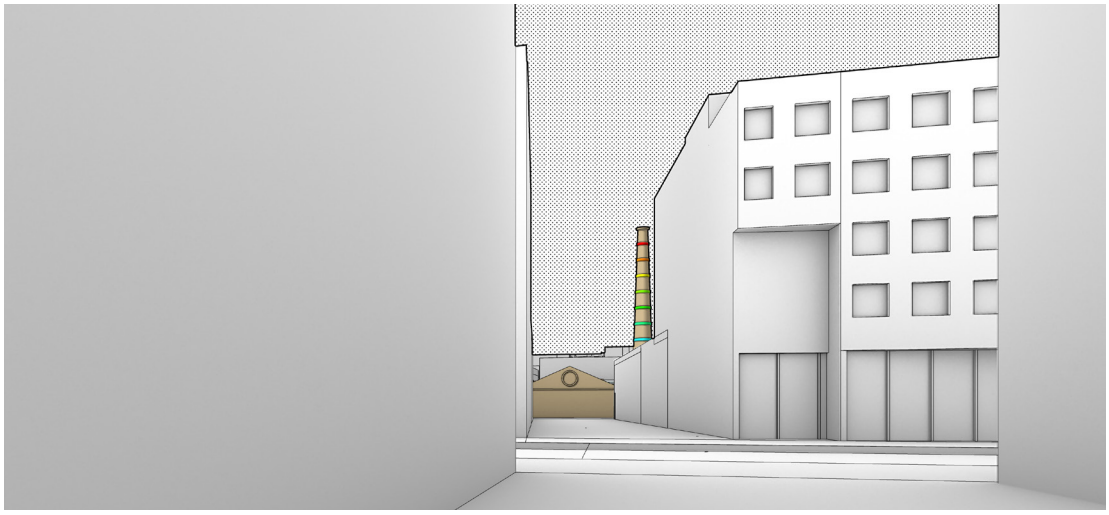


Figure 3.18 Fissure 1

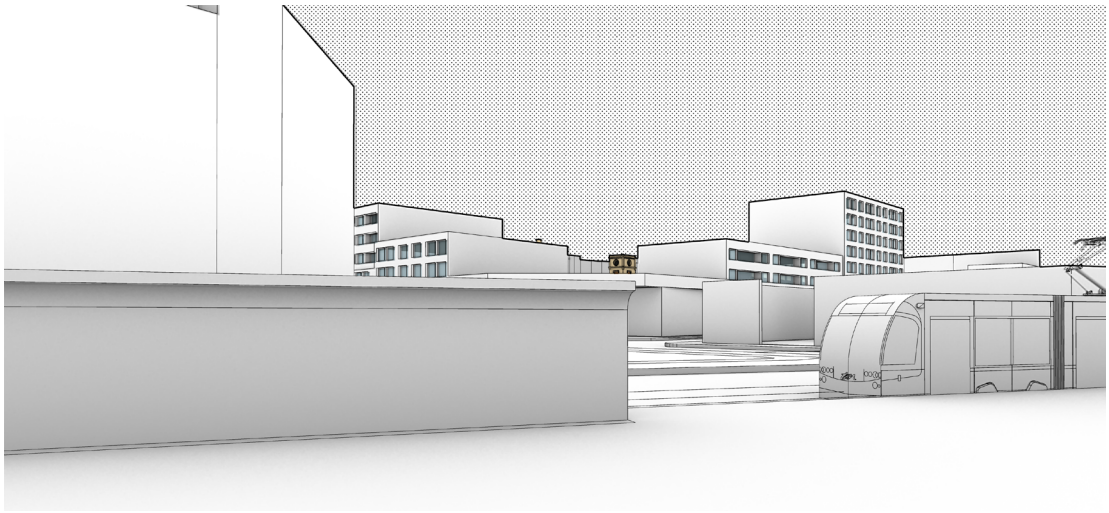
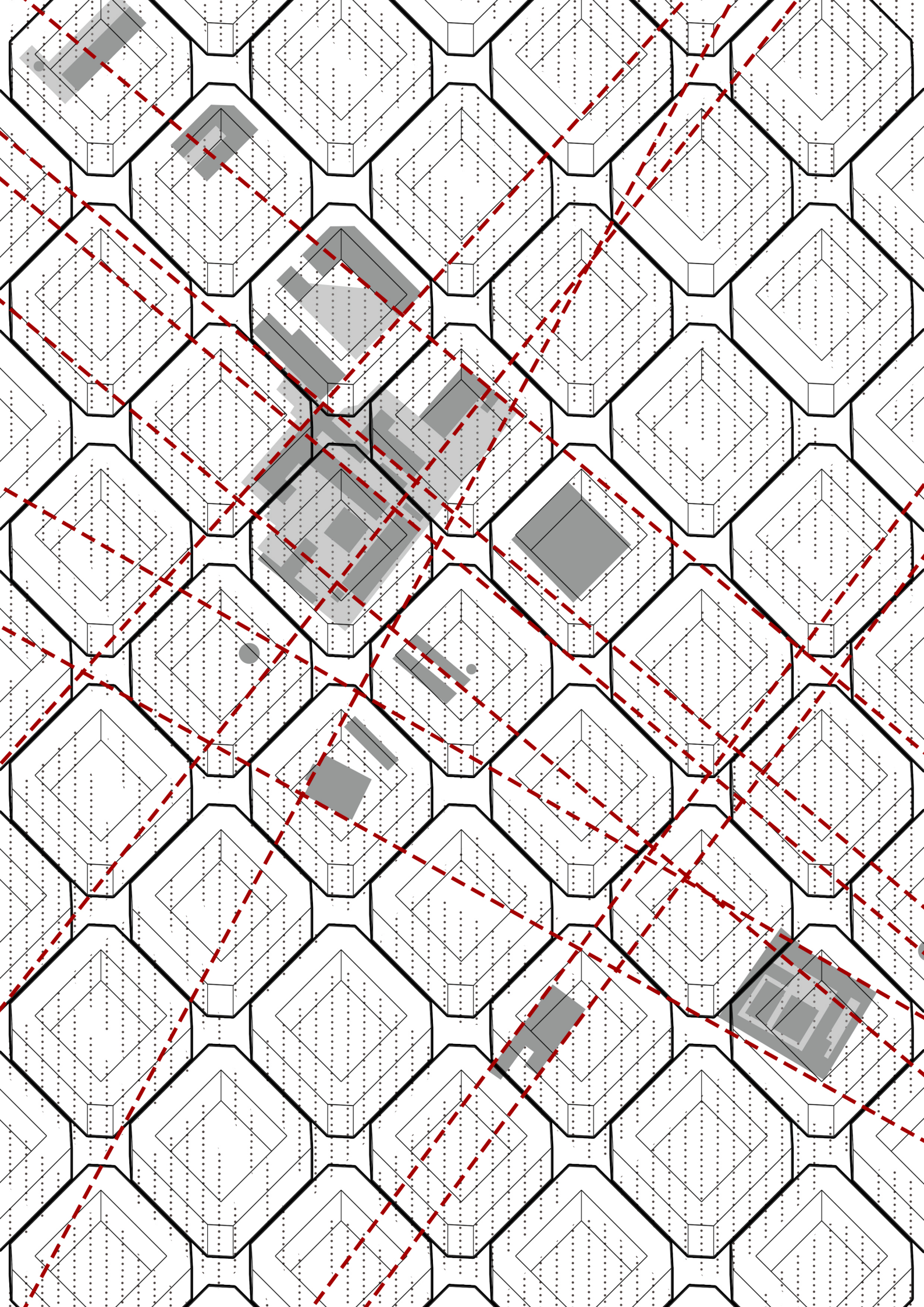


Figure 3.19 Fissure 2



‘ Industrial + Cerdà ’

Vertical Diversity by Overlapping Integration

Pedestrian City: Jane Jacobs, Jan Gehl, Gorden Cullen
´Les Pilotis´: Le Corbusier, Constant Nieuwenhuys, Ron Herron
Overlapping: Top, Ground level, Underground
Proposal: Vertical Integration for Cerdà Poblenou and Industrial Precinct

Pedestrian city is an important part of New Urbanism theory. It emphasizes the advantages of pedestrian, rather than vehicles. Ground level experiences and activities are crucial to street vitality. Some urbanists, like Jane Jacobs, Jan Gehl, Gorden Cullen, focusing on different aspect of it, including factors, method and analysis, etc. They are valueable for studies on street vitalization.

Regarding pedestrian and vehicle, the layouts from industrial period and Cerdà plan shows absolutely different attitude of it. Orthogonal grid of street network benefits vehicles a lot because they don´t need to take too much turnings, but at the same time, the continuous and ample experiences of pedestrian are seperated into pieces. The pre-Cerdà layout presents the feature of diversity and flexibility, it also maintain the precious information of historical layout, which can also be part of urban collective memory.

In this chapter, we will discuss the methodology of integrating industrial heritage with Cerdà grid.

´Overlapping Cerdà´ shows the possibility of integration. There are lots of former theories relevant to it, including les Pilotis in Five Points for a New Architecture by Le Corbusier, and New Babylon by Constant Nieuwenhuys, and the Walking City by Ron Herron, etc. Overlapping is taken theoretically to deal with complexity from different layers or factors. Generally, layers of projects can be classified in three category: top, ground level and underground, regarding various situations of context and requirements.

Can Ricart and its adjacent buildings can be taken as a sample of ´Overlapping Cerdà´ , where Cerdà orthogonal grid, industrial heritage and its elements could be reorganised in different levels conciously, but work together optimally.

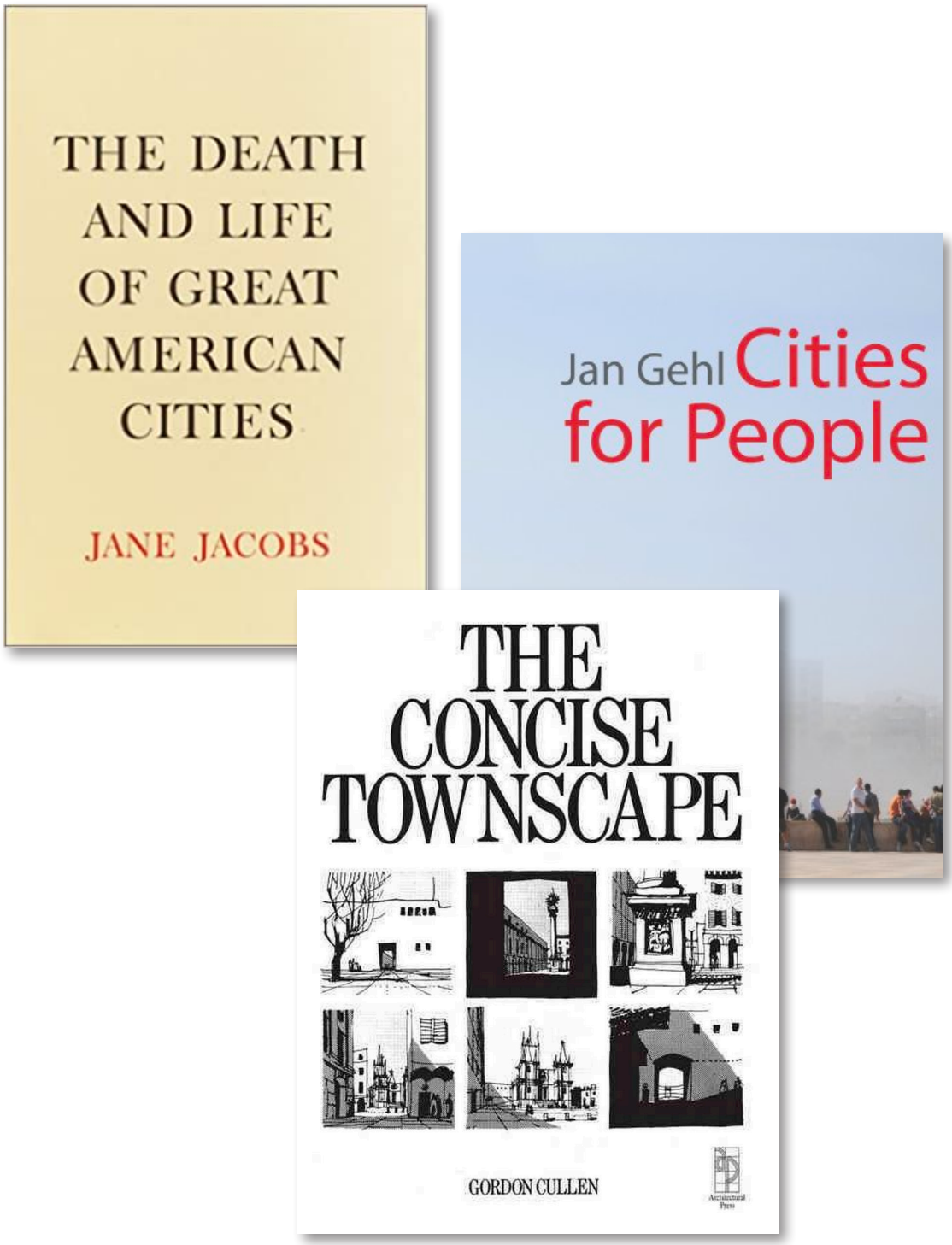


Figure 4.1 Previous Studies on Pedestrian Level Space

Pedestrian City: Jane Jacobs, Jan Gehl, Gorden Cullen

City is complex and contradictory. It is a organism with changes and unpredictable things every moment and every corner. Thus, if we look back through the timeline of history, it is so obvious that ideal orthogonal city can never be achieved as long as the city grows bigger enough. A clear, single and rational idea lacks ability for adapting possibilities, which has been emphasized by Jane Jacobs in her book, *The Death and Life of Great American Cities*.

She emphasized the importance of diversity in street spaces, for it was closely related to our everyday lives. People choose to live in city to have better lives rather than static one. So she observed city from views of human being, as she described a street life from day to night as 'ballet'. Therefore, street corners and porches can be reasons of everyday lives in the street.

Most of everyday activities for communications in the city happen in the street at the ground level. From the feeling of pedestrian, we can have better understanding of what is vitality of a city exists and relies on.

Therefore, new urbanists believed that pedestrian life in city could encourage the communications among residents. And city can never run well without hunmanity factors. So they restricted speed of vehicles to encourage pedestrian mobility. And as Jan Gehl presumed that continuous system of pedestrian lanes could be good connections between public spaces, which was presented in his book, *Cities for People*.

Gordon Cullen thought further towards topic of pedestrian city. He came up with a research methodology which became popular later, called 'Serial Vision'. It is combined with a series of coherence perspective drawings to show the observation and feeling of pedestrian in mind, which is useful to revitalization of standard urban spaces.

´Les Pilotis´: Le Corbusier, Constant Nieuwenhuys, Ron Herron

How to enhance diversity in pedestrian spaces under the rules of Cerdà grid planning can be a crucial topic considering the transformation of Cerdà blocks. It is the fundamental contradictions between two layers in Poblenou in reality. Overlapping has long been discussed for renovation and reorganization between different layers. It provides chances for different restrictions and situations to be well organised in unity.

Les Pilotis - Le Corbusier

Les Pilotis is one idea of the Five Points of New Architecture firstly published in Le Corbusier's famous book, Towards a New Architecture. Early in Le Corbusier's career, he had come up with a system of architecture principles, including les Pilotis, the Free Ground Plan, the Free Façade, the Horizontal Window and Roof Gardens.

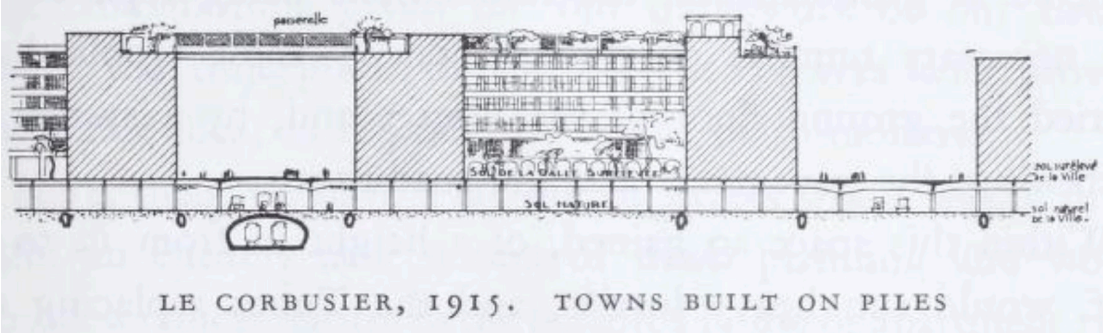


Figure 4.2 Les Pilotis & Ville Radieuse - Ground Level for Activities

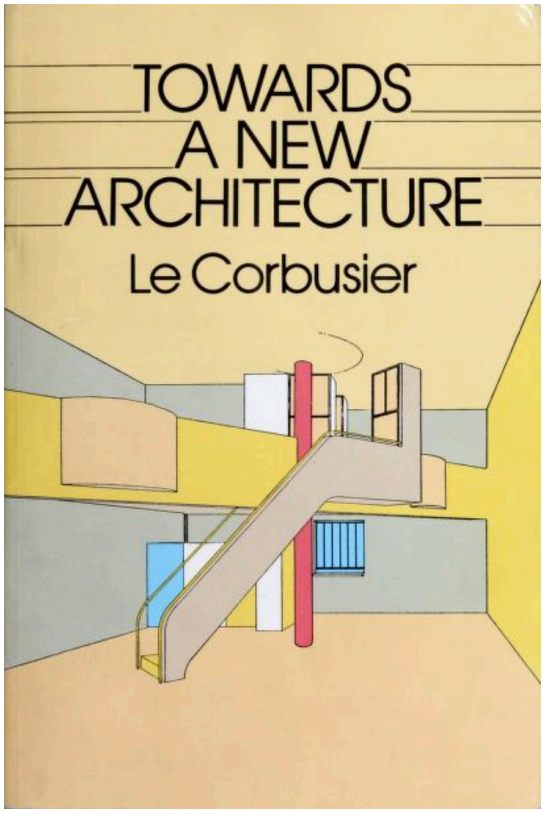


Figure 4.3 Le Corbusier and Five Points of New Architecture

Figure 4.4 Unité d´Habitation de Berlin - Pracetice of les Pilotis with Free Ground

He presumed modern architecture as a living machine, so that architecture design should be based on the need of functions.

Thus, he rethought issues of city in funtionalism. As is shown in this book, he presented his proposal, Towns Built on Piles, in 1915. He strcitly divided dwelling and public spaces for living with other functions, such as commerce, rapid traffic, telecommunications, pipes for water suppliment and sewage, etc. The dwellings were built on a new ground of the town, including bridges as steets, which was 12 to 16 feet supported by forest of concrete pillars. Servant functions was set underneath the actual ground of town, in order to liberate spaces for residents to enjoy themselves in free ground plan. (Le corbusier, 1986)

He paid attention to the topic of how to coordinate contradictions between absolutely different requirements of activities for residents, and finally came up with the idea of ´Les Pilotis´, which was practiced in many projects of him

New Babylon - Constant Nieuwenhuys

Constant Nieuwenhuys was deeply influenced by cubism artists like Pablo Picasso and Georges Braque. Thus, he paid more attention to elements and its relations. From 1956, he started concerning issues on architecture. Associating with his thinking about artworks, he gradually developed his idea, New Babylon, which has great impact on the formation of Rem Koolhaas´ idea.

In New Babylon, he dreamed that unlimited freedom could be guaranteed so that ´collective creativity´ was more important than ´functionalism´. In other words, every emotional or attemptis is reasonable. He presumed to divide spaces of New Babylon into various sectors, which were also the unit of his ideal city. In order to have more chances for getting in touch with each other, which he thought was the base of urban space construction. He presumed that New babylon was in permanent changing. Every part of it is movable and could be combined or seperated for free. (Wigley)

But due to the restrictions existing in reality, he presumed a system of mega structure, which was lifted 16 meters away from ground level by pillars for all kinds of situations that could happen in everyday lives, including even murder, sexual temptation, violence, etc. The floating mega structure above the earth could provide several times area for different requirements of users, with possibility of growing veritcally for more layers or floors in certain sectors. He has made many studies and attempts in sections and masterplan, and selected several cities all over the world to make proposals of them, including Barcelona. Although his idea seems to be unrealistic, it still shows Constant´s idea of how to deal with two contradictory layer into a unity and provide more spaces for new requirements emerging in the unpredictable future.

The Walking City - Ron Herron

The walking city is part of Archigram theories

Figure 4.5 Section Model of Lifted Sectors in New Babylon by Constant Nieuwenhuys - Lifted Sectors for Different Activities to Avoid Doing Damage to Old Layout

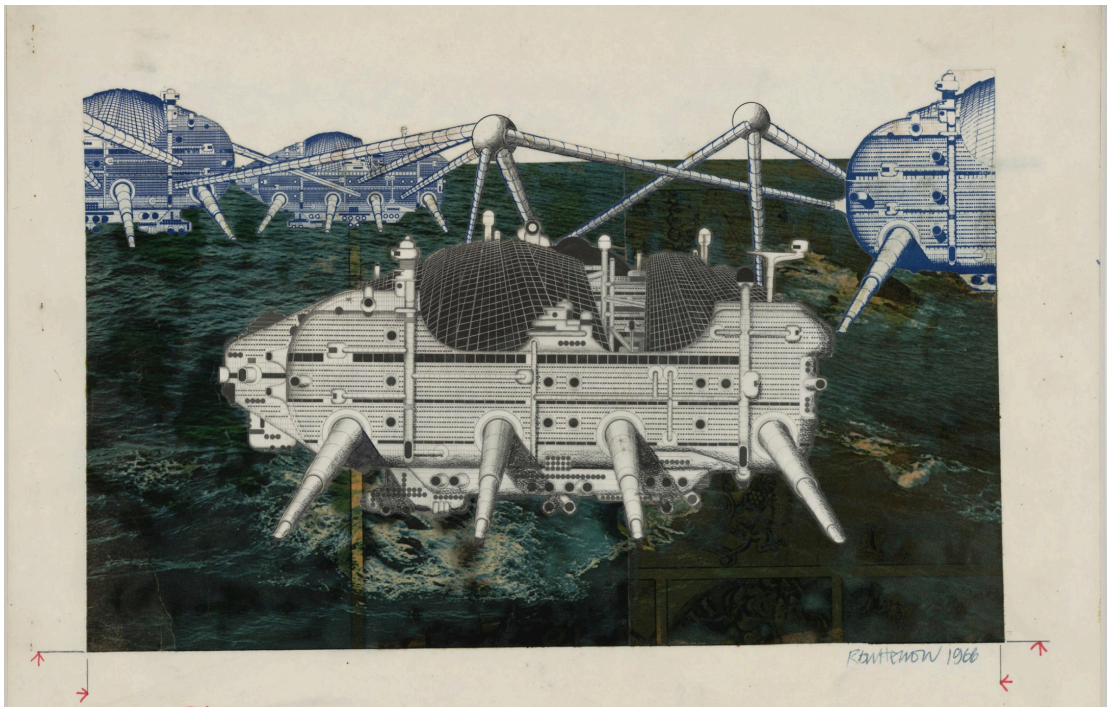


Figure 4.6 The Walking City after a Nuclear War by Ron Herron - A Vanguard Methodology for Escaping from Adverse Context

created by Ron Herron in 1961. The group of Archigram, including Warren Chalk, Peter Cook, Dennis Crompton, David Greene, Ron Herron and Michael Webb, is anti-heroic and they believed architecture should satisfy itself primarily, other than talking about what it was used to be in the city. So they showed their three main ideas: Walking City, Living Pod, and Instant City.

Herron supposed that city was always changing, but the history of architecure was always bulldozing. City should have the capacity of self evolution. Therefore, in the story of Walking City, he presumed a future world destroyed by nuclear wars and natural disasters. City is like an enormous insect, which is assembled by replaceable mechinary. Meanwhile, as the environment become no longer suitable for city, the big insect can move automatically to find new places for resources exchange. In Herron's theory, city is not static but changeable and moveable with legs supported. It indirectly shows his idea of preserving living layers from outside layer to avoid risks. (Emily Rowlings, 2018)

Overlapping: Top, Ground level, Underground

Stadel Art Museum, Frankfurt, Germany, Underground Overlapping

In the spring of 2008, an international competition for expanding the exhibition area for modern arts of the Staedel Museum was hold in Frankfurt, Germany. German architects Schneider, together with his partner Schumacher, expanding the original museum by putting the new layer underground while remaining old layer seemed to be unchanged. As a result, by putting the expanded new layer underground in the original museum garden, they expanded its exhibition area from 4000 square meters to 7000 square meters. The newly expanded underground pavilion is 76 meters in width and 53 meters in length, while the maximum height of the central part is 8.2 meters high.

The outer skin of the expanding new exhibition space is a curve roof scattering with 195 roof skylights. These round shape skylights range in size from as small as 1.5 meters to as large as 2.5m at the highest point in the center, imitating the water wave created from four corner of the garden. Moreover, the skylights have been under special design that LEDs and blinders hidden in these skylights can make great difference when daylight outside is too dazzling or too weak. The expanding exhibition space can maintain a proper condition of illumination for artworks. As for structure, owing to the high water table, the outer skin of new layer is supported by 12 slim reinforced concrete columns and 160 deep piles to prevent it floating, while allowing people to walk on it without restrictions.

Unilever Nederland, Rotterdam, Top Overlapping

The office of Unilever Nederland BV overlaps the current factory building and the existing his-

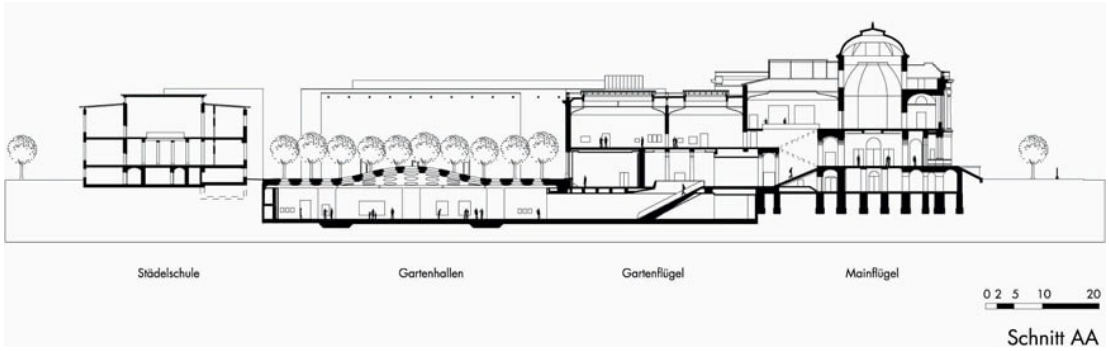


Figure 4.7 Underground: Section of Stadel Art Museum, Schneider + Schumacher

Figure 4.8 Underground: Garden of Stadel Art Museum, Schneider + Schumacher

toric structure, with a mega column system stand on the pier to give a sense of Brutalism. It has a multi-level brilliant industrial form. The building exhibits a strong sense of sculpture, defining the city's unique skyline, from controlling its volume, direction and area. The new office has four floors, which is 133 m long and 32 m wide. The first floor is 25 meters above the pier level. The main entrance is on the pier, next to the original office, built in 19th century. Vertical transportations, such as stairs and elevators, are located in the interior lobby to guide people to the new Layer.

In the new layer, because of the direction and the relative location between new volume, the Maas River and Pier, it creates a great view of river scene and skyline of Rotterdam. Although there is nearly no similarity between old part and new part, even for the direction, this kind of volume crossing without any extra design is still delivering the culture of Unilever.

Exactly the same as the last one, the newly built layer makes the additional building self-supporting, too. Thus, the building is much more like a bridge span across the old building, which also cope with city theme: Bridge. Moreover, we can also find some courtyard on different levels, to let the skylight get into interior office naturally, but provide a silence place for staff to have a rest or activities as well.

Acropolis Museum, Bernard Tschumi Architects, Ground Floor Overlapping

The Acropolis Museum is located in the south-east of Parthenon, Athen, but is also 1000 feet lower than it. There are ruins of an archeological excavation where it stands, from 4th century to 7th century in Athen. Like Poblenou in Barcelona, the site here is also full of layers from different periods and different factors from context. So it was how to deal with the complexity that Bernard Tschumi mainly concerned about.

As he presumed, the museum is like a sandwich, combining different layers regarding a great variety of complex but charming situations of context adjacent to the site in different directions and different levels. Bernard Tschumi proposed a museum which is nothing like a monument, but a container which can be so flexible that can not only conciously show all the attractions in a spectrum of art pieces created in different historic periods of Athen, but reorganise them into integration.

He reorganised them into a chronological sequence of timeline, from pre-historic period, to the late Roman period, and finally reaching the highlight of Parthenon Frieze. He sorted them out into vertical layers. Visitors can arrive at each layer in order by escalator in the middle concrete mobility core.

The base layer is suspended by 100 slender concrete pillars, standing on the ruins underground. The journey of Arcropolis artworks is started in this level. Thus, some other facilities, such as lobby, museum shop, service center and temporary exhibition, located here. At the beginning, visitors can have a close touch with the ruins, like

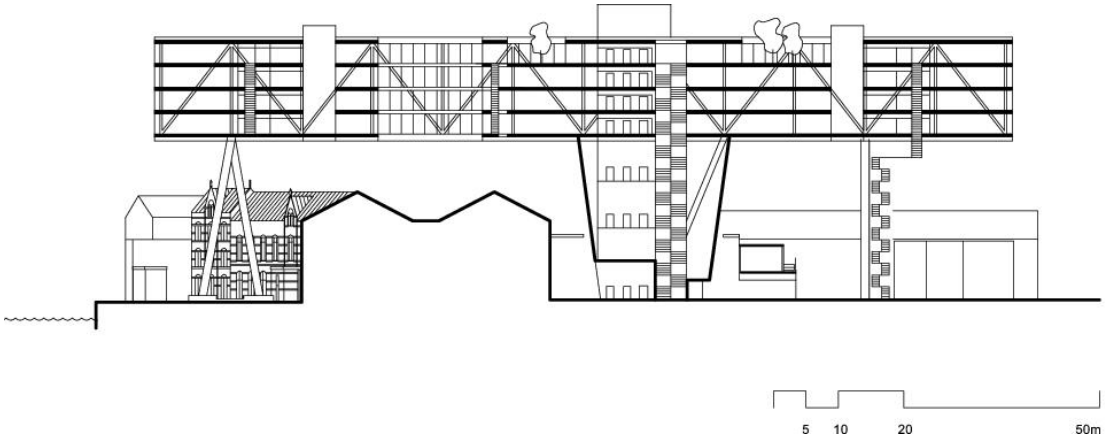


Figure 4.9 Top: Section of Unilever Nederland, JHK Arhitecten

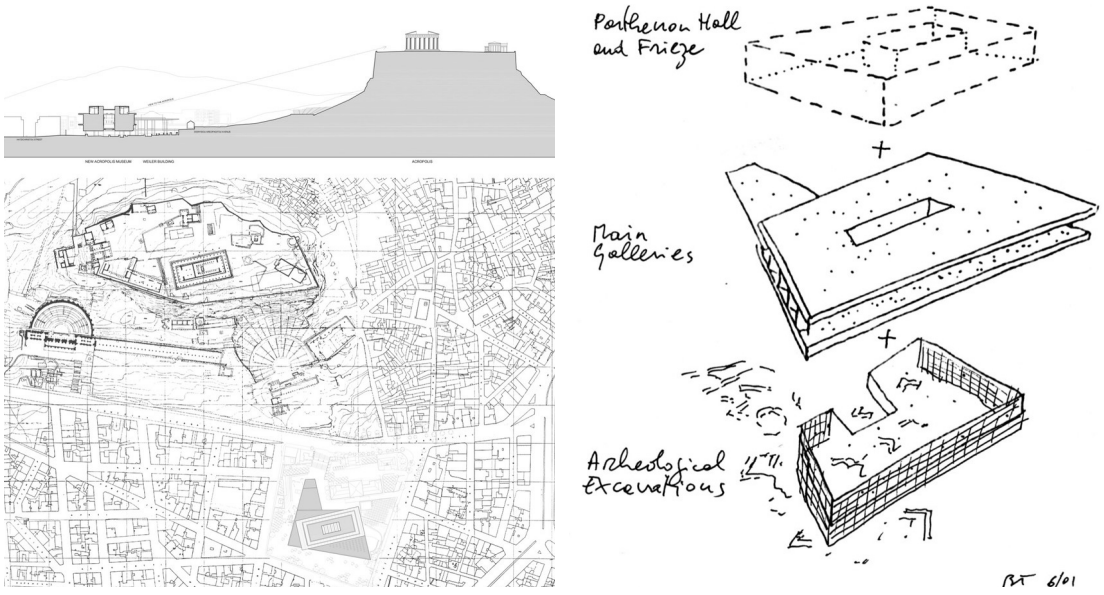


Figure 4.10 Underground-Ground Level-Top： Acropolis Museum, Bernard Tschumi Architects

many archeological museum.

The middle layer, which is also at the ground level, is a high gallery for artworks from Archaic period to late Roman period. It is a trapezoidal volume in shape. Artworks are lifted at different level to provide various visual experiences. Meanwhile, rather than taking solid façade, the perimeter of ground layer uses glass curtain wall to have a full view of urban scenery of Athen. Accompanied with high space, visitors could have a special feeling from the contrast throughout time and space.

The top layer is the highlight of whole museum. It gains idea from the plan of Parthenon, with rectangular plan and concrete core applying vertical mobility and sunlight in the middle, to have a good response to typology of the ancient Anthem temple. It has the same direction of it as well. Vistors can have a exactly front direction and proper level to have a full view of Parthenon In other words, it has an angle of 23 degree from other layers of museum but remaining the rectangular concrete core to be unchanged. In this way, Tschumi made a good composition of urban context, exhibitions and experiences from vistors by overlapping different layers, and properly establishing connections between them vertically.

Overlapping methodology can be applied in different situations for renovation projects regarding the type, scale and level of original layers. It is efficient to make compositions between conservation and development, or reorganising different factors towards the same project and its context. As is shown above, underground overlapping, like Staedel Art Museum in Frankfurt, can be applied to the alergic conservation project, in which heritages are well preserved and of high value to refuse any interventions of its shape and urban scenery. Underground can be exploited as a good resource to have chances for new functions, and to have good interactions with ground level to create vivid public spaces. But the problem is connections between two layers always have bad effect on the original structure of old buildings, so that the interventions should be as minimum as possible.

Overlapping in Ground level and top level could have more or less effects on the appearances of original layers. But they work in different scale. Ground level overlapping changes the bottom of original building, like Sant Antoni Library mentioned before, or Acropolis Museum. It could improve the spatial conditions of original layer to be much more open and transparent than before. It is always applied to enhance the connection between original building and context. But these interventions are like micro surgery made on the old layer, patching the weakness of old interfaces of old layer, but quite improve the urban space at pedestrian level very well. Top level overlapping shows the ambition of refitting original image of city to be a collage of two layers. It is brutal but clear to distinguish different parts and interventions happened in history. In other words, it is also a special kind of conservation in philosophy. But it may be faced with many problems like municipal regulations or structural problems. Thus, it could be usually big project if considering in this way.

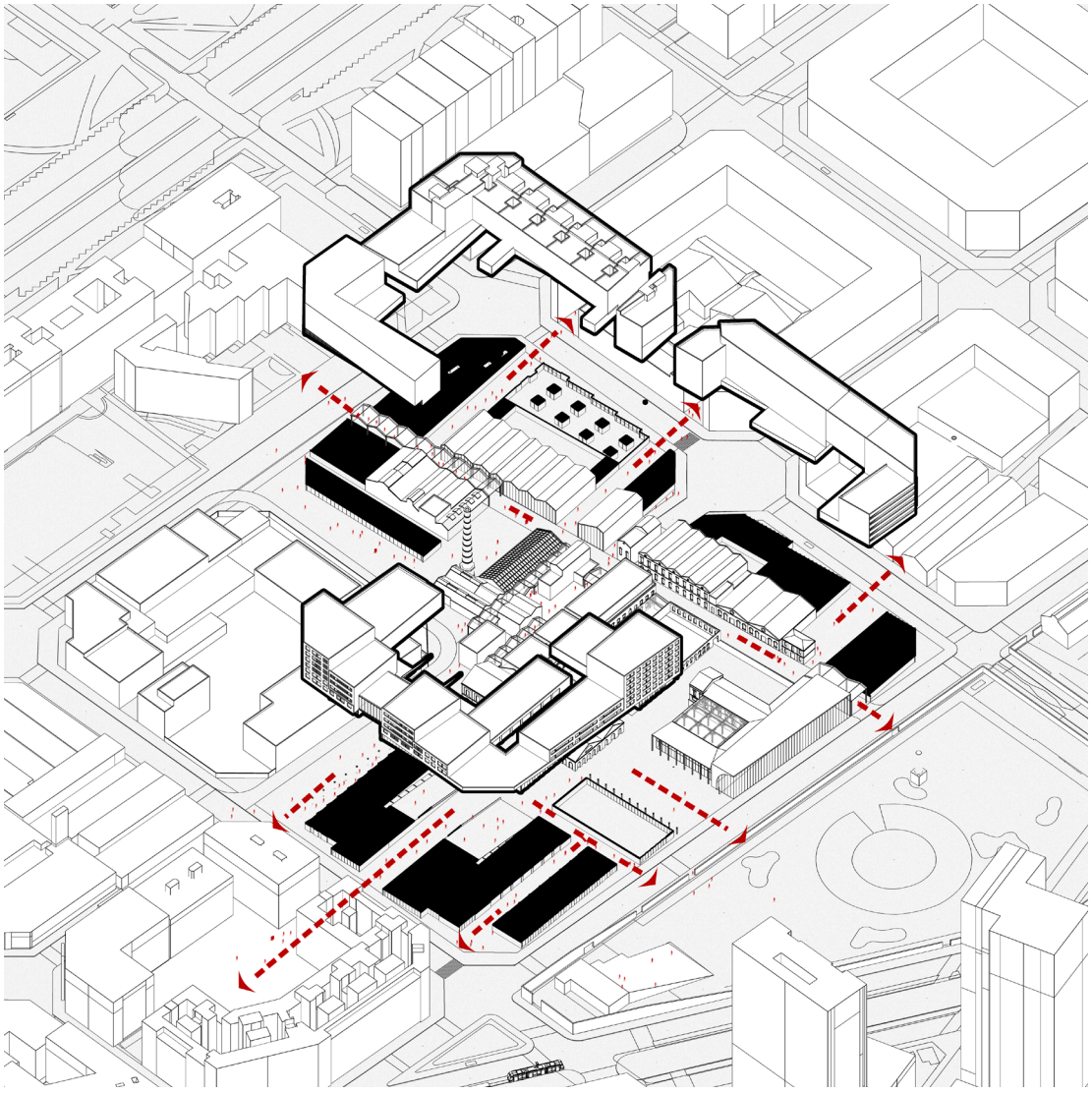


Figure 4.11 Overlapping of Layers for Penetration from Industrial Heritage Precinct

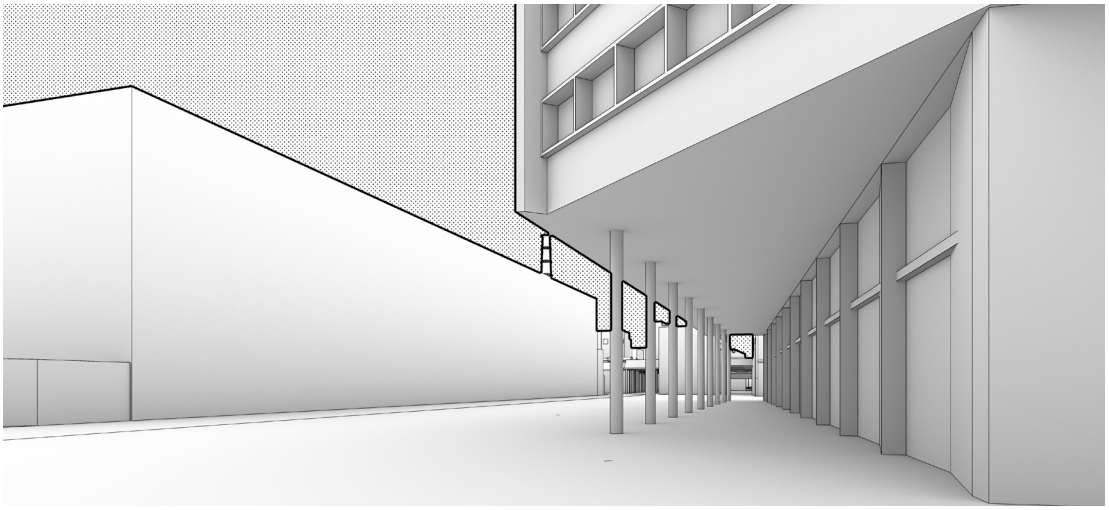


Figure 4.12 Grey Space from Overlapping

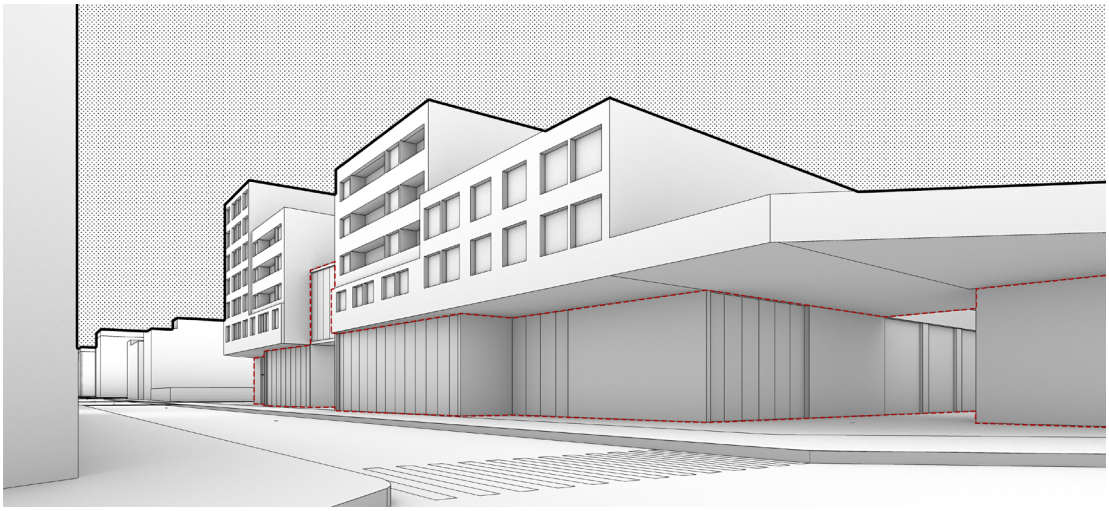


Figure 4.13 Grey Space from Overlapping

Figure 4.14 Interface of Street Space from Overlapping

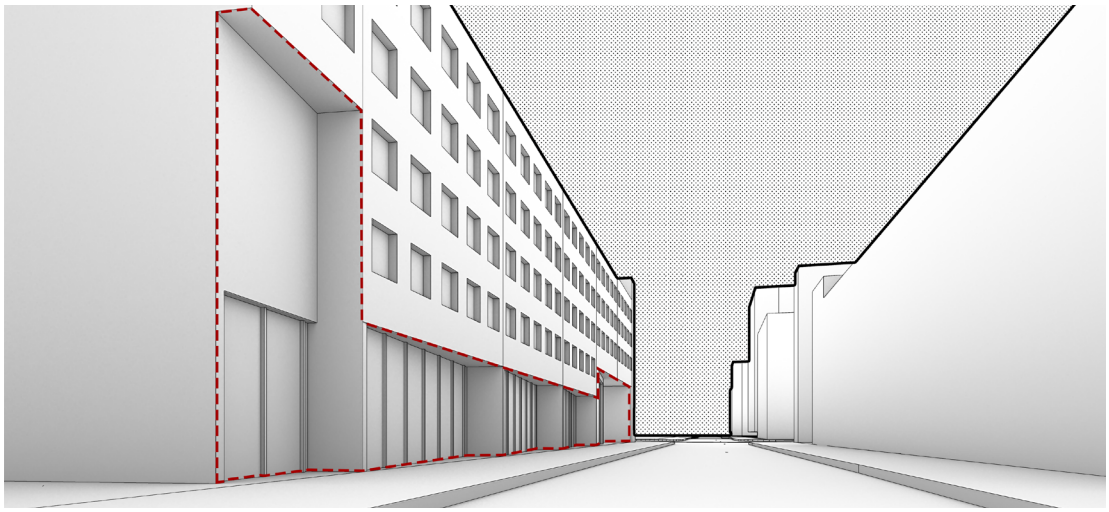


Figure 4.15 Interface of Street Space from Overlapping

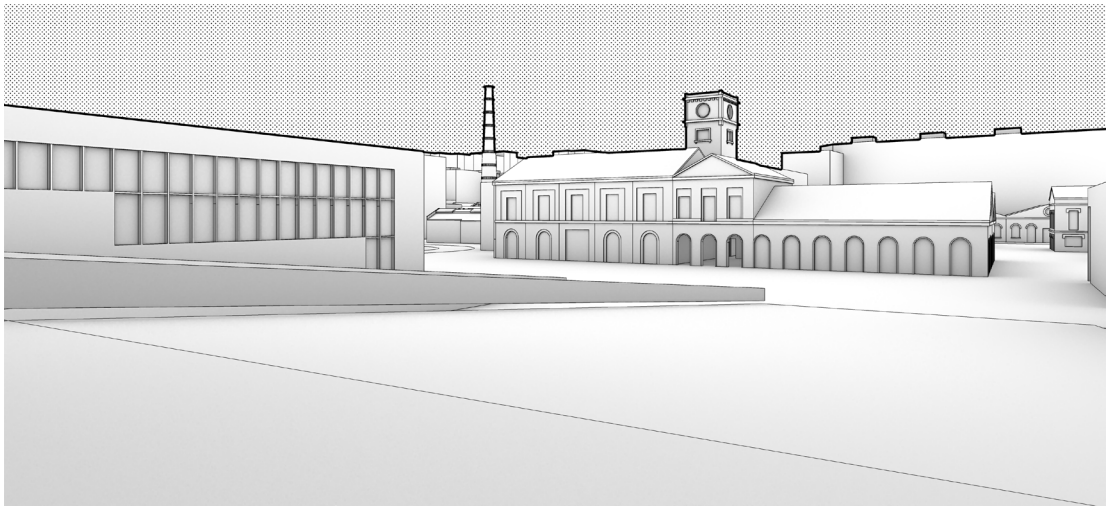


Figure 4.16 Terrace from Overlapping

According to the thesis above, I transform the ground level of blocks to follow the layout of old precinct in general, trying to make smooth penetrations from factory precinct to urban context, also to introduce people with exceptions mentioned before into it.

After opening the ground level spaces to public, industrial heritages can never be the isolated ‘treasure’ without vitality in different boring blocks. Instead, they penetrate through ground floor to be absorbed in urban spaces, while enhancing the diversity of pedestrian spaces of surroundings vice versa.

Overlapping two layouts into a integration produces vertical diversity to new forms of Cerdà blocks and can also be a sample for other blocks in Poblenou.

Meanwhile, it can also create chances for tranforming buidlings of Cerdà blocks for diverse interfaces of streets and courtyard. Grey spaces or just changes in façade can be capplied in different situations, by controlling the setback of ground level façade from streets. As a result, the peripheral standing by the streets are mainly transformed only in façade, while the buildings near main passage are tranformed with grey spaces for pedestrians.

Courtyards can also be tranformed by different terraces following the old layout, which are quite diiferent with peripheral in form. Some terrace facing the oldest façade are transformed as lawn slope for activities.

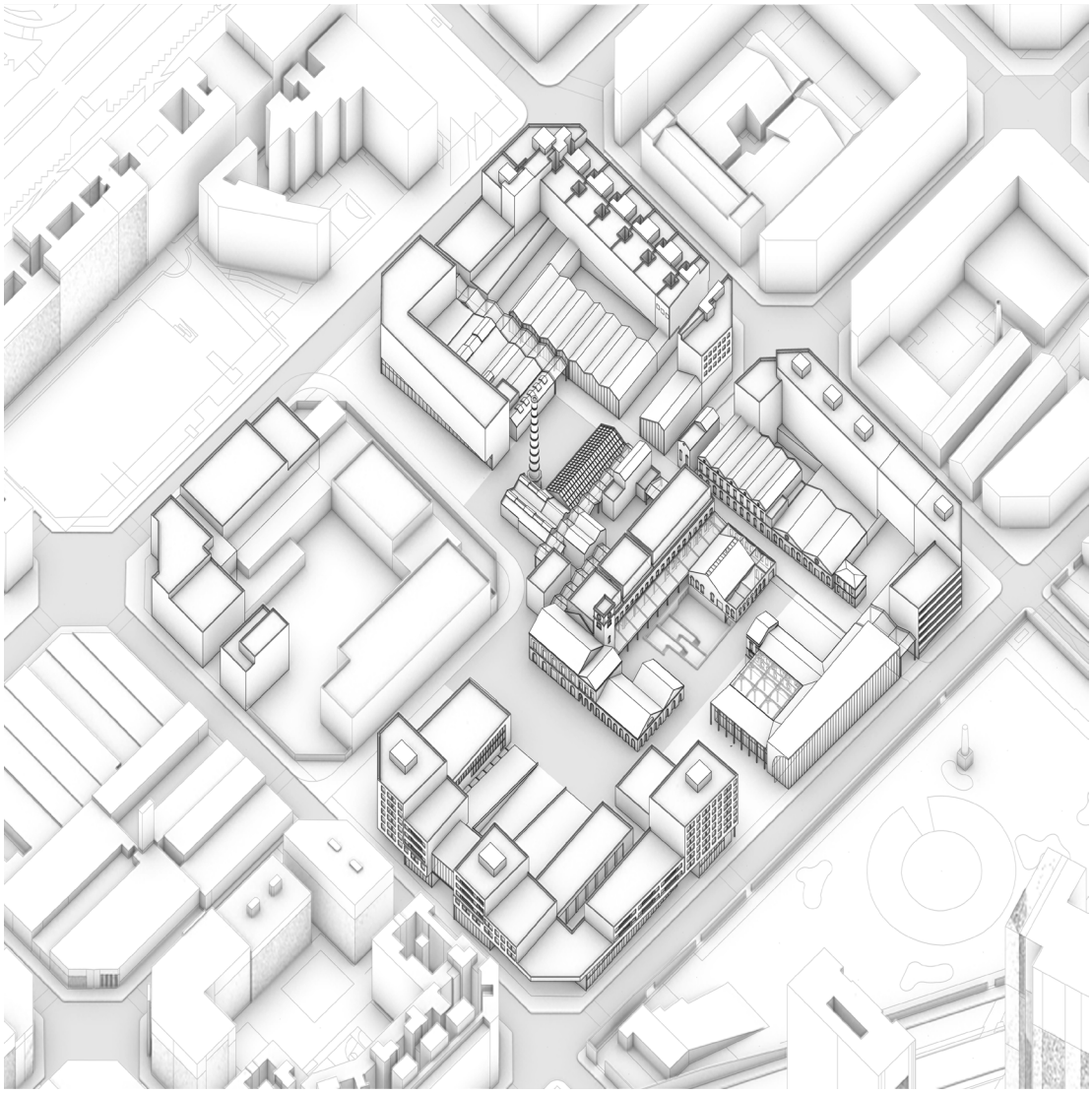


Figure 5.1 Orthogonal Axonometric

Conclusion

Spatial Value of Industrial Heritage for ´Cerdà´ Context
Technical Drawings

Like many big cities all over the world, density and height of buildings in Poblenou is continuously increasing, especially under the plan of ´22@ District'. Actually, some of Poblenou blocks has been transformed into highrise building clusters, such as blocks in Glòries, Passage Pujades and the crossing of Diagonal Avenue and Carrer Pere IV. Architects´ practices and theories show their thinking in Cerdà block of a future metropolitan of Poblenou. But the unique spatial and formal features from old layout and elements of industrial heritages are gradually dissolved into ´forests´ of large scale and monotonous inerfaces.

Spatial value of industrial heritage is supposed to be well recognised in formal revolution of Cerdà blocks in Poblenou. As is mentioned in last chapter, pedestrian takes an important position in urban lives. Thus, ground level space vitalization benefits urban lives a lot. At the same time, continuing layouts of industrial heritage provides chances for them to get involved into Cerdà blocks and the future metropolitan in Poblenou.

In this chapter, project of Can Ricart will be continued as a sample for conducting different layouts of surroundings and also elements of itself. City can never be as pure as geometry shapes or calculation. The form of it should have capacity for adapting other contradictory factors to be included and well organised. Barcelona shows a good example for many developing cities all over the world, which are trying to growing with diversity and uniqueness. And this is why I choose Barcelona as example and objective place to develop my thinking and proposal.

Figure 5.2 De Hallen Amsterdam - the Spatial Value of Industrial Heritage

Spatial Value of Industrial Heritage for ´Cerdà´ Context

Although othorgonal grid planning is still taking an dominant position in image of Barcelona city, it deeply influence the development from past even to the future. The concept of urban units still shows its value of emphasizing isolation while creating public spaces in different methodologies in different situations. However, contemporary cities are always organised under systemetic mind and people can never live in some absolutely isolated urban units like former cities before. Public spaces and buildings are no longer obliged to following any rigid principles but only established on the need of urban activities. It shows strong demand of connections between different sectors and elements of city.

However, as a matter of fact, grid is still spreading in Poblenou, which shows a strong contradictions with industrial heritages. They are reorganised to sank into grid. The original continuous urban layout was cut into fragments by rational urban units. Industrial heritages are like private treasures hidden in blocks. And it seemed to be that Poblenou and the downtown area of L´Eixample are becoming more and more similar. Poblenou is losing its unique features.

As a result, overlapping is presumed to solve the problem of Cerdà grid spreading while preserving and regenerating the old layout and urban spaces. Industrial Heritages can be engaged in urban pedestrian spaces by penetrations following the old layout.

On the other hand, the old layout can be precious value of indsutrial heritages, especially precincts with several elements assembled together, for urban expansion nowadays. As the city is continuouly growing to the sky, the ground level spaces are becoming organised and large. It lacks the possibilities brought by chaos originated from different situations, which could be carrier of urban activities. Nowadays, some urban renovation projects has emphasize the idea of taking advantage of old outdoor spaces of industrial heritages. For example, De Hallen Amsterdam, which was a precinct of carriage garages for railway, is now transformed to be a large precinct of cultural complex, including restaurant, market, gallery, etc. The most attracting space was the main passage of precinct. It was preserved while surrounded urban context has already been rebuilt. Nowadays, the main passage is like the recorder of urban spaces in the past, while providing special experience and diverse activities in this old district. Industrial precinct provided spatial chances to reform urban spaces with this kind of ‘chaos’ from old period.

In conclusion, spatial value of industrial heritages of poblenou can never be ignored for it provides chances for diversity in pedestrian view of the city. Although standard blocks are isolated like islands of Barcelona, which prevent inner space to have interactions with outside, including these heritages. But we can still take overlapping to release the ground level of units to context. In this way, industrial heritage can never be dead relics in the past, but positive urban space in the future. Heritages could have different effects on different positions of city.

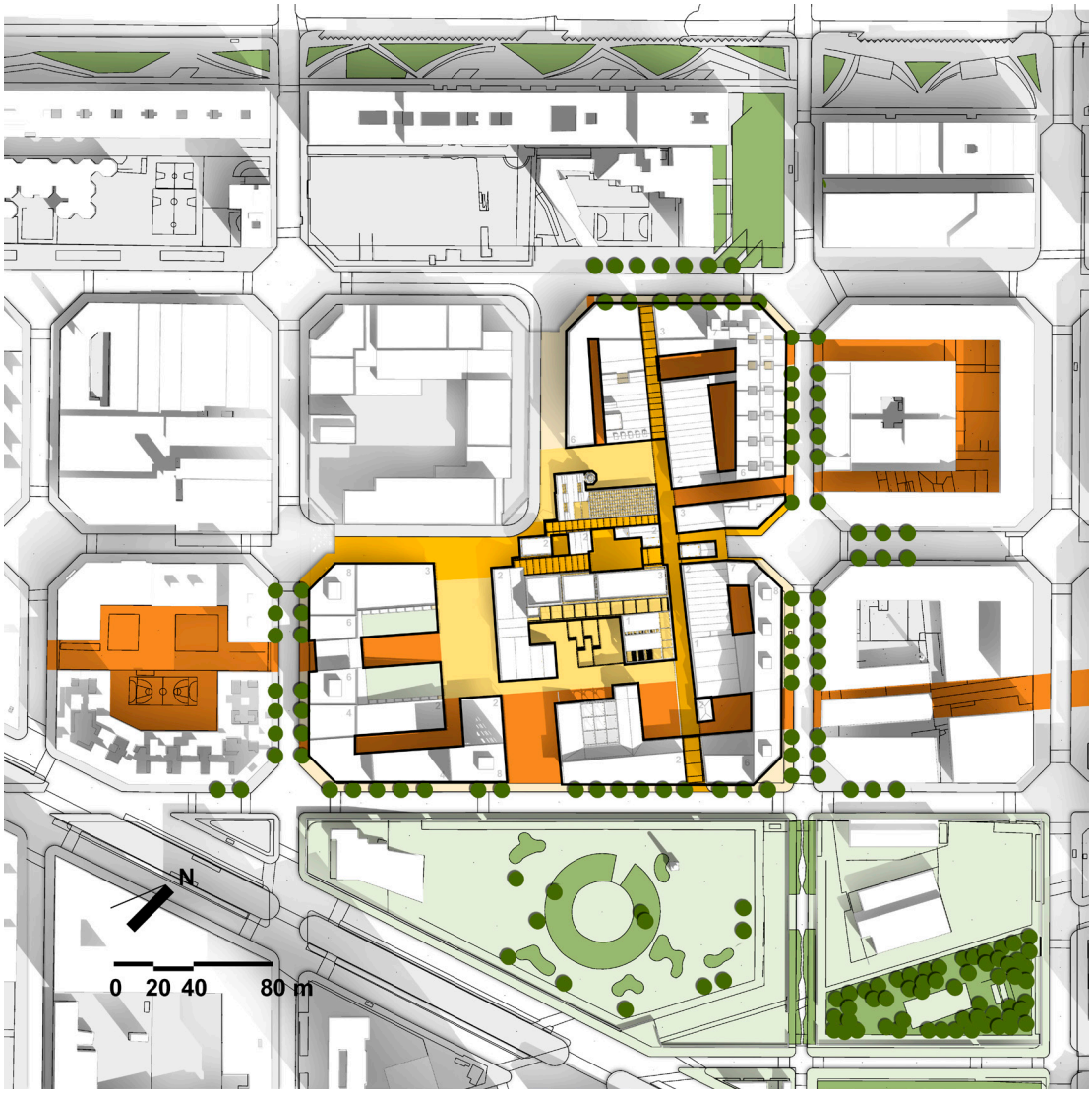


Figure 5.3 General Plan

Figure 5.4 Ground Floor

Figure 5.5 Section A - A

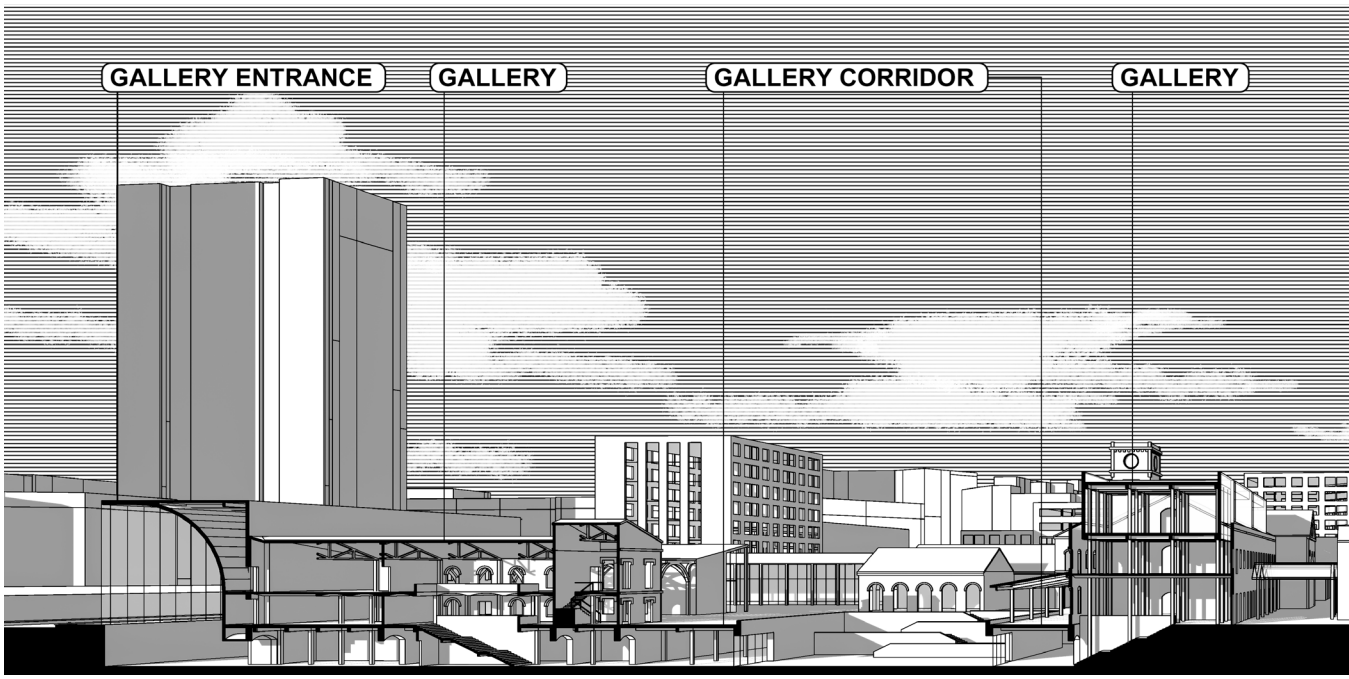
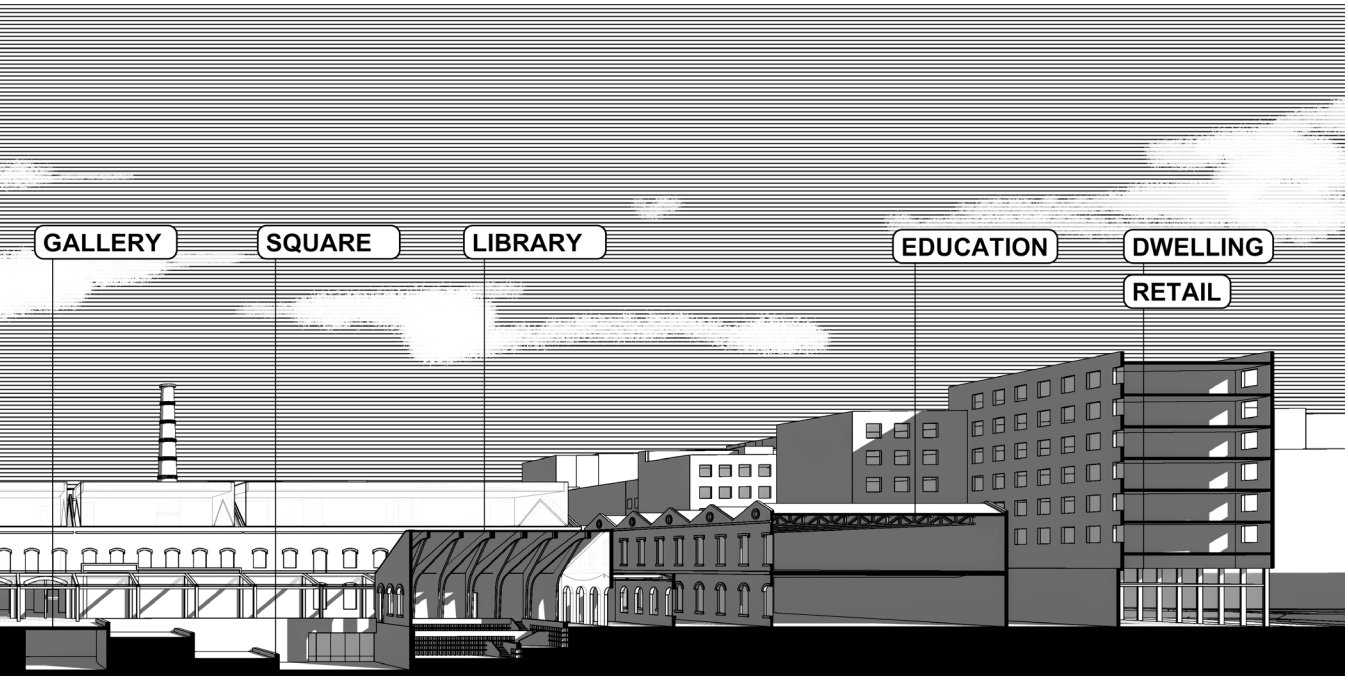
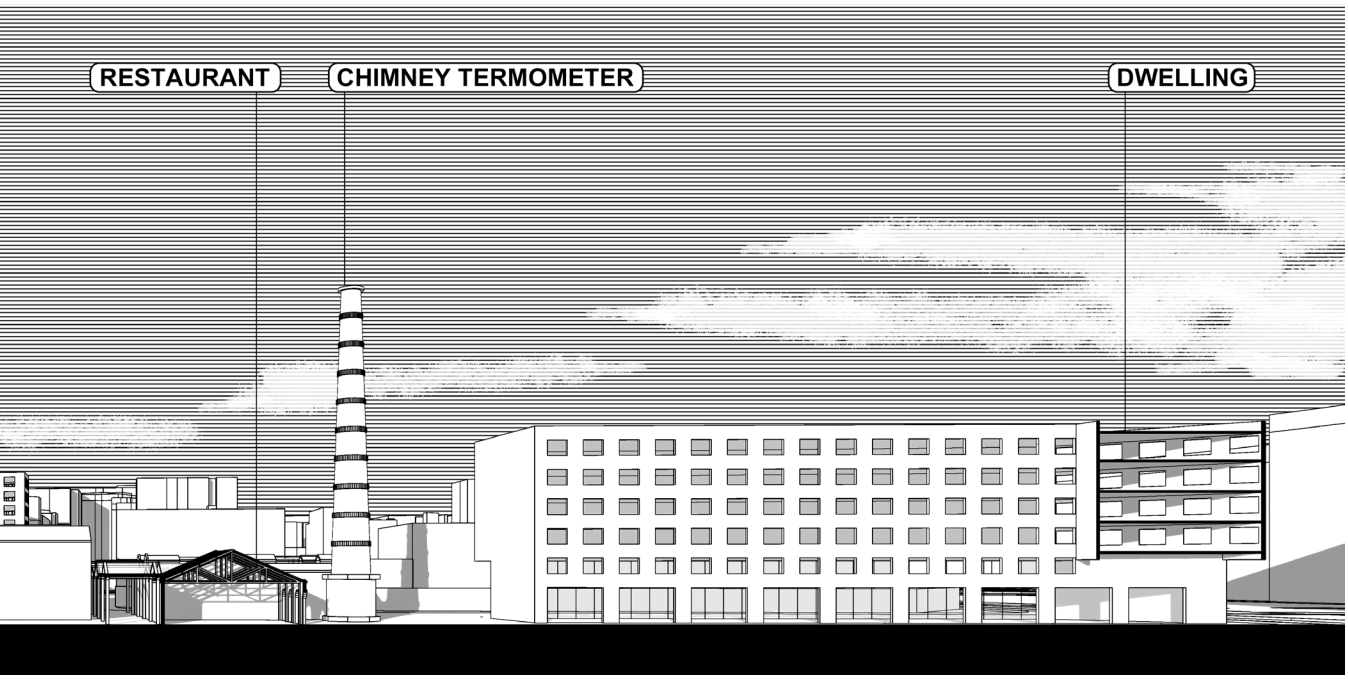


Figure 5.6 Section B - B

The Contemporary Project
MBArch ETSAB UPC
Refitting Industrial Cerdà
Formal Revolution for Can Ricart under Cerdà Context
Student: Zhiwen Wang
2020-2021





BOOK

Complexity of Poblenou

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IMAGE

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Aerial photography of Superblock in Poblenou - google earth

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